OCTOBER, 1960
VOL. III, NO. 6

JAN 3 '61

roblems of Economics

Selected Articles from
Soviet Economics Journals in English Translation

IN THIS ISSUE

Ia. Kvasha and V. Krasovskii: Rates of Reproduction and the Structure of Capital Investment (Voprosy Ekonomiki, No. 6, 1960).

Standard Methodology for Determining the Economic Effectiveness of Capital Investments and New Technology in the National Economy of the USSR (Planovoe Khoziaistvo, No. 3, 1960).

E. Torgonenko: The Transition to a Seven-Hour Working Day and the Adjustment of Wages in Construction (Sotsialisticheskii Trud, No. 4, 1960).

A. Aganbegian: Methods of Analyzing and Calculating the Distribution of Workers and Employees by the Amount of Wages (Sotsialisticheskii Trud, No. 2, 1960).

S. Strumilin: Social Productivity of Labor and Methods of Measuring It (Voprosy Ekonomiki, No. 5, 1960).

B. Miroshnichenko: Coordination of the National Economic Plans of the Socialist Countries (Voprosy Ekonomiki, No. 3, 1960).

A. Frumkin: The Bourgeois Theory of the "Foreign Trade Multiplier" (Vneshniaia Torgovlia, No. 12, 1959).

PUBLISHED IN THE UNITED STATES BY
INTERNATIONAL ARTS AND SCIENCES PRESS
156 5th AVENUE • NEW YORK 10, NEW YORK

Problems of Economics

TABLE OF CONTENTS

l. III, No. 6

October, 1960

CAPITAL INVESTMENT

KVASHA and V. KRASOVSKII: Rates of Reproduction and the Structure of Capital Investments
(Voprosy Ekonomiki, No. 6, 1960). 3

ndard Methodology for Determining the Economic Effectiveness of Capital Investments
l New Technology in the National Economy of the USSR
(Planovoe Khoziaistvo, No. 3, 1960). 11

WAGE STRUCTURE

TORGONENKO: The Transition to a Seven-Hour Working Day and the Adjustment of Wages in Construction
(Sotsialisticheskii Trud, No. 4, 1960). 18

AGANBEGIAN: Methods of Analyzing and Calculating the Distribution of Workers and Employees by the Amount of Wages
(Sotsialisticheskii Trud, No. 2, 1960). 23

LABOR PRODUCTIVITY AND THE THEORY OF VALUE

STRUMILIN: Social Productivity of Labor and Methods of Measuring It
(Voprosy Ekonomiki, No. 5, 1960). 34

FOREIGN TRADE AND INTERNATIONAL ECONOMIC RELATIONS

MIROSHNICHENKO: Coordination of the National Economic Plans of the Socialist Countries
(Voprosy Ekonomiki, No. 3, 1960). 45

FRUMKIN: The Bourgeois Theory of the "Foreign Trade Multiplier"
(Vneshniaia Torgovlia, No. 12, 1959). 54

PROBLEMS OF ECONOMICS

Selected Articles from Soviet Economics Journals in English Translation

PROBLEMS OF ECONOMICS is a complete, literal translation, without editorial comment, of articles selected from the following Soviet publications:

VESTNIK LENINGRADSKOGO UNIVERSITETA, SERIIA EKONOMIKI – JOURNAL OF LENINGRAD UNIVERSITY, ECONOMIC SERIES
VESTNIK MOSKOVSKOGO UNIVERSITETA, SERIIA EKONOMIKI – JOURNAL OF MOSCOW UNIVERSITY, ECONOMIC SERIES
VESTNIK STATISTIKI – JOURNAL OF STATISTICS
VNESHNIAIA TORGOVLIA – FOREIGN TRADE
VOPROSY EKONOMIKI – PROBLEMS OF ECONOMICS
MIROVAIA EKONOMIKA I MEZHDUNARODNYE OTNOSHENIIA – WORLD ECONOMY AND INTERNATIONAL RELATIONS
NAUCHNYE DOKLADY VYSSHEI SHKOLY, EKONOMICHESKIE NAUKI – SCIENTIFIC REPORTS OF HIGHER EDUCATIONAL INSTITUTIONS, ECONOMIC SERIES
PLANOVOE KHOZIAISTVO – PLANNED ECONOMY
EKONOMICHESKAIA GAZETA – ECONOMIC GAZETTE
SOTSIALISTICHESKII TRUD – SOCIALIST LABOR

Articles from other publications are included from time to time if they are considered of sufficient interest for translation.

PROBLEMS OF ECONOMICS is published as a service for purposes of information and education. Twelve issues per year. Subscription rate: $50.00 per year; $4.50 per copy. Managing Editor and Publisher; Myron E. Sharpe. Editor: Murray Yanowitch.

ADVISORY COMMITTEE: Walter Galenson, Institute of Industrial Relations, University of California; Gregory Grossman, Department of Economics, University of California, Leon M. Herman, Legislative Reference Service, the Library of Congress; Franklyn D. Holzman, Department of Economics, University of Washington; Holland Hunter, Department of Economics, Haverford College; Lynn Turgeon, Department of Economics, Hofstra College.

NOTE: Members of the Advisory Committee make suggestions of articles for translation. The Editor, however, is solely responsible for the final choice of articles and for all other matters pertaining to the magazine.

INTERNATIONAL ARTS AND SCIENCES PRESS
156 5th Avenue, New York 10, N. Y.

© Copyright 1960 by Myron E. Sharpe. All rights reserved.

Voprosy Ekonomiki, No. 6, 1960

KVASHA AND V. KRASOVSKII:

ıtes of Reproduction and the Structure of Capital Investment

The efficacy of the productive mechanism, its efiency, is heightened with the expansion of its rking component — machinery. Modern trends in hnical progress are reducing the size of machin- per unit of its productive capacity and thereby modifying the ratio of outlays for buildings to lays for equipment. The economic significance his change in the technological structure of cap- investment (1) is that it helps to reduce the cap--output ratio, which is one of the principal fac- s in increasing the rate of expansion of social duction. Tentative estimates indicate that under dern conditions an increase of one point in the re of machinery and other equipment in the ag- gate industrial investment in the USSR would se the annual volume of industrial output by 5 to illion rubles. Hence, the changing trend in the hnological structure of capital investment, the sibilities of increasing the share of equipment in ed capital, and an analysis of the experience of ustrially developed countries in Western Europe of the USA should be carefully scrutinized in s respect.

The complexity of the problem is due to the fact t one must begin with construction statistics ch show the relationship between construction k and equipment in value terms, while the in- mation that interests us must be obtained by ana- ing the composition of fixed capital in kind and increment. It therefore becomes necessary, on one hand, to eliminate the value fluctuations ch obscure the dynamic and international com- isons, and on the other, to concretely analyze the nnical and construction decisions in the light of requirements of modern technology.

n the United States the technological structure apital investment has been studied by a number uthors — R. Gordon, S. Kuznets, A. Hansen and ers — who used long-term series of relationships xpenditure for construction and equipment main- or the purpose of offering an apologetic inter- tation of the capitalist cycle. However, whatever purpose of these investigations, the data pre- ted by the above-named authors are unquestionably valuable. In West Germany similar studies have been conducted by R. Krengel and F. Gruening. All these authors note a trend toward an increase in the share of outlays for equipment in aggregate capital investment. R. Gordon made the following estimates of the ratios of outlays for construction to the volume of investment in equipment for the period 1869 to 1950 in the over-all economy of the USA (2):

1869-1878	3.2	1909-1918	1.7
1879-1888	2.6	1919-1928	1.5
1889-1898	3.3	1929-1938	1.2
1899-1908	2.3	1946-1950	0.8

These global data on capital investment in the American economy, including the non-productive sector, indicate that a constantly decreasing proportion of national investment was allocated to construction. One should be careful not to apply these trends, derived from data on the whole economy, to industry.

To characterize the developments in the technological structure of capital investment in industry we believe that the more reliable data are supplied by Tibor Barna, who calculated investment in the USA, Britain and West Germany in terms of US dollars of 1950 purchasing power, applying special currency equivalents for construction work and equipment (see table on the following page).

This table shows that the share of equipment in total capital investment in the USA, Britain and West Germany is not identical. Neither is the change in the structure of capital investment. For the period covering 1929 to 1956 the share of expenditures for equipment in Britain ranged from 70 to 80%, in West Germany from 55 to 70%. In spite of the prevailing ideas, the structure of capital investment in the leading and technically advanced industry of the United States appears to be far less favorable than is the case in Britain, whose industrial capacities are to a large extent worn out

Technological Structure of Capital Investment in the Manufacturing Industries of the USA, Britain and West Germany
(in 1950 prices)*

Years	USA		Britain		West Germany**	
	Billion dollars	% of Expenditures for equipment	Billion dollars	% of Expenditures for equipment	Billion dollars	% of Expenditures for equipment
1929	5.6	41.1	0.60	76.7	0.44	65.9
1930	3.8	44.7	0.58	77.6	0.35	65.7
1931	2.3	56.5	0.48	79.2	0.21	66.7
1932	1.1	72.7	0.41	80.5	0.11	63.6
1933	1.7	47.1	0.43	76.7	0.16	62.5
1934	1.9	52.6	0.61	77.0	0.28	64.3
1935	2.1	66.6	0.72	75.0	0.44	68.6
1936	3.0	63.3	0.87	74.7	0.58	63.8
1937	4.1	53.6	0.95	76.8	0.76	64.6
1938	2.4	62.5	0.85	80.0	0.97	64.9
1939	2.7	62.9	1.26	—	1.17	65.0
1940	4.0	57.5	1.80	—	1.20	65.0
1941	5.4	50.0	2.38	—	1.29	65.9
1942	3.2	68.7	1.65	—	1.29	68.2
1943	2.6	84.6	1.06	—	1.10	68.2
1944	3.4	82.3	0.58	—	0.79	68.4
1945	5.4	68.5	0.38	—	0.19	68.4
1946	8.3	51.8	0.57	79.0	0.19	68.4
1947	8.1	63.0	1.01	73.0	0.26	69.2
1948	7.4	67.5	1.14	78.7	0.66	54.5
1949	5.8	67.1	1.28	78.1	0.97	66.0
1950	6.3	73.0	1.47	78.2	1.20	65.0
1951	7.4	68.9	1.58	79.7	1.39	64.7
1952	7.4	70.2	1.50	75.3	1.46	64.4
1953	7.4	70.2	1.43	74.8	1.67	64.1
1954	6.8	70.6	1.51	75.5	1.95	64.6
1955	7.3	63.0	1.82	70.9	2.35	66.0
1956	8.7	66.6	2.08	68.7	2.45	68.2

* Tibor Barna, "Das Industrielle Anlage vermögen im Vereinigten Königreich," in Vereinigten Staaten von Nordamerika und in der Budnesrepublik Deutschland, Deutsches Institut für Wirtschaftsforschnung, Vierteljahrshefte zur Wirtschaftsforschnung, 1957, Zweites Heft.

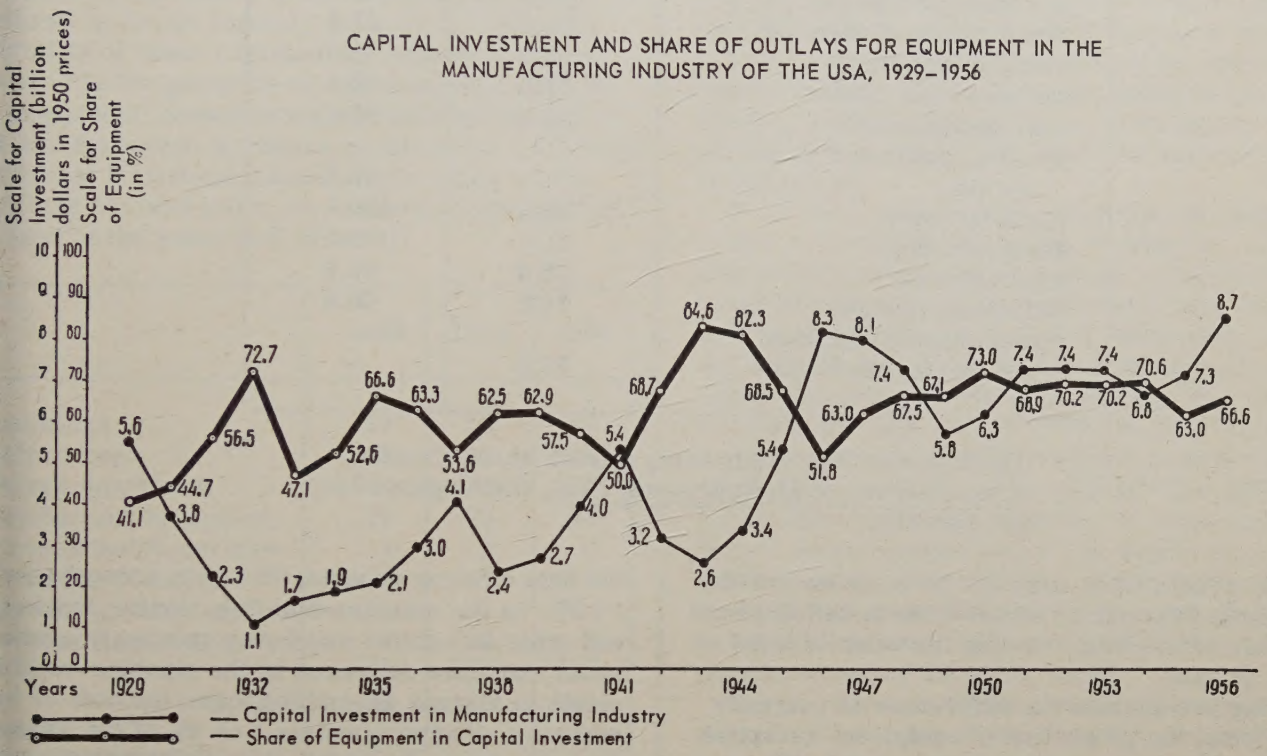
** Including extractive industries.

and obsolescent. This comparison shows, among other things, the caution one must exercise in contrasting the technological structure of capital investment in different countries, and the part played in this field by the specific features of national statistics. The data in the above table indicate that the share of expenditures on equipment has increased sharply in the USA. To a large extent this is du to the fact that 1929 is taken as the base year, t very year in which the USA began the compilatio of statistics on capital investment. Moreover, 1 marked the highest point of economic expansion fore the greatest depression in the history of ca talist crises. In capital investments, which wer

mense for that time, outlays for construction of v factories accounted for an overwhelming share. ıs explains the high proportion of construction l assembly work. In subsequent years, on the oth- hand, when the reduced volume of capital invest- nts was mainly allocated to the partial expan- n and reconditioning of existing enterprises, the ıre of equipment in capital outlays rose sharply.

It should be noted that in every cycle the highest volume of capital investment has as its counterpart the smallest share of outlays for equipment (see chart below). However, if cyclical fluctuations are overlooked, there will appear a clear-cut trend toward an increase in the share of outlays for equipment in capital investment in the manufacturing industry of the USA.

CAPITAL INVESTMENT AND SHARE OF OUTLAYS FOR EQUIPMENT IN THE MANUFACTURING INDUSTRY OF THE USA, 1929–1956



'he technological structure of capital investment Soviet industry has also been steadily improving r since the beginning of the 1930's. However, cial statistics show that the share of equipment apital investment in the USA is 25 points higher ı in the USSR. A similar relation prevails (with ıor variations in either direction) in almost all ıstrial sectors (see table on the following page). ıs a rule both American and Soviet statistics ssify as equipment all removable instruments of or, i.e., instruments which are in the main prod- s of the machine-building industry (in American minology — mobile equipment). This similarity nethods of reckoning capital investments has led ıe investigators to make direct comparisons of statistical data of both countries. These com- isons lead to inferences that are not always d, because there are differences in the methods omputation and grouping of some components of enditures in American and Soviet statistics (as- ıbling of equipment, assembly materials, li- ses and patents, research work, etc.), which in the aggregate increase the actual gap between the indicators of the share of equipment in the capital investment of these countries. Yet the principal cause of this apparent discrepancy is the difference in currency equivalents for construction and assembly work and the output of the machine-building industry.

When American economists compare the volume of capital investment in the United States and the Soviet Union they are unwittingly inclined to apply the so-called tourist rate of exchange (ten rubles to the dollar) in their computations, whereas the actual relation of ruble to dollar in terms of purchasing power is far more favorable to the ruble. In construction work we compute the currency equivalents by comparison of consolidated indicators of the value of industrial buildings of similar design and size. The data on the value of industrial buildings in the USA were derived from the bulletins published by the firm of Marshall and Stevens for 1951 and adjusted for 1958 prices by using the price index of construction and assembling work.

Share of Equipment Expenditures in Capital Investment in the Industries of the USA and USSR (in %)

Industry	USSR (1958)	USA (1956)
Ferrous metallurgy	29.2	66.3
Non-ferrous metallurgy	26.3	58.4
Machine building	54.3	73.6
Chemical and rubber	27.6	76.4
Building materials	46.4	67.4
Timber, paper and wood-working	—	75.5
Light industry	50.2	80.8
Food industry	61.5	72.4
Coal industry	28.4	63.2
Petroleum and gas	30.8	60.6
Power plants, electrical and thermal systems	27.2	—

* US Department of Commerce, Bureau of the Census, Annual Survey of Manufactures, 1956, Washington 1958, pp. 109-112.

The Soviet data were compiled from collections of consolidated indicators of the value of buildings and installations used for revising the value of fixed assets in 1960.

Taking into account the differences in currency equivalents, the proportion of equipment in capital investment in Soviet industry evaluated in US dollars amounts to 48% (40% in rubles). Thus, the adjustment for the difference in currency equivalents brings the indicators of the technological structure of capital investment in Soviet and American industry substantially closer together.

***

Differences in this structure are further reduced by adjustments which take account of the specific features in the grouping of outlays for equipment and construction in Soviet and American statistics. Soviet statistics include the cost of equipment assembling and assembly materials (and in some cases the cost of foundations) in the construction and assembly component of investment, while American statistics include these in the cost of equipment. Moreover, in some sectors the cost of assembling and of the materials used in this work account for as much as 30% of the outlays for equipment. For instance, the estimate of West German firms for an iron and steel works in India set the expenditures for assembling the equipment at 13.2%. In the USA chemical industry, according to the data of some experts, this item accounts for 14.3%. In the machine-building, textile, footwear and other industries employing relatively mediun sized machines delivered by the machine-buildin plants in already assembled form, the cost of installation is approximately 3 or 4% of the outlays for equipment. Inclusion of expenditures for installing the equipment in the total outlays for the latter in all industry raises the share of these ou lays in the aggregate capital investment by five t six points.

Construction work in US statistics includes onl the work done in putting up essential components industrial buildings (crane-supporting pillars, et USSR statistics go much further in this direction incorporating under this heading the cost of plun ing, conditioning, intra-plant pipe lines, heating units, etc. A special study made by the Giprome design institute has demonstrated that if in the c struction of blast-furnaces the outlays for instal tion were grouped according to the method used American statistics the share of equipment woul increase by 30 to 50%. This, of course, is an ex treme case. For industry as a whole this kind o adjustment would increase the share of equipme in Soviet capital investment by one or two points.

One should also note that in the USA the sum c capital investment includes the cost of licenses, patents, and research work in technological

ocesses. In the USSR these expenditures are as ule accounted for in the state budget and are not koned under the heading of capital investment. ese differences translated into figures charac- izing the technological structure of capital in- tments require a further adjustment amounting one or two points.

The aggregate of the above adjustments increases share of equipment in the structure of capital in- tment in Soviet industry from 40 to 58%. The iability of these adjustments reflecting the dif- ences in the grouping of components of outlays equipment, construction and assembling in So- t and American statistics is indirectly confirmed Central Statistical Administration data on the ucture of fixed productive assets in state indus- (end of the year; in % of total).

	1950	1956	1958
Buildings	28	26	27
Structures	23	25	26
Power equipment	8	9	8
Production equipment	27	25	24
Transmission devices	4	6	6
Transport facilities	7	7	7
Inventory, tools and other fixed assets	3	2	2
Total	100	100	100

Narodnoe Khoziaistvo SSSR v 1958 godu, Statistical Yearbook, Gosstatizdat, 1959, p. 59. The structure of fixed assets in industry is computed on the basis of the initial value (without deduction for depreciation) of the assets in the prices prevailing at the time of purchase.

ll the components of the fixed assets tabulated ve which may be unquestionably classified as ipment (power and production equipment, trans- ssion devices, means of transport, inventory, ls, etc.) amounted in 1958 to 47% of the replace- nt value of fixed productive assets. On the other d, according to the Central Statistical Adminis- tion, equipment accounts for only 40% of capital estment. To a large extent this discrepancy is lained by the fact that when machines are in- ded in the operating balance sheet their price as nventory item includes the outlays for installa- and frequently the cost of their foundations. nother rather important group of fixed assets — structures — is of an extremely heterogeneous composition. In addition to roads, bridges, fences, capacities and reservoirs, it includes mining installations: shafts, faces, bore holes and certain types of products of the building industry which are in fact machines: hardening and roasting furnaces, water-cooling towers, and so on. This defect in the classification of fixed assets complicates their economic analysis, in particular, a reliable division into active and passive components. This has a considerable effect on the analysis of statistical data on capital outlays, for in this case construction encompasses the entire output of construction enterprises irrespective of the future technological role of this output.

It has been pointed out earlier that the adjustments in foreign exchange equivalents for construction and equipment, as well as the adjustments eliminating the non-comparability of statistical data on the structure of capital investment, reduce the apparent gap in the share of equipment in total capital investment in Soviet and American industry to 10 points: 58% for the USSR and 68% for the USA. It follows that the relative technological structure of capital investment in the USA and the USSR is not as unfavorable for the latter as might appear from a direct comparison of the statistical data of both countries. Nevertheless, the economic importance of measures designed to increase the share of equipment in capital investment in Soviet industry should not be underestimated.

The gap between Soviet and American industry in regard to the share of investment in the active component of fixed industrial assets stems largely from the four following factors: 1) the predominance of outlays for reconstruction and modernization in American capital investment; 2) relocation of some US industries to the South and West, to areas with a mild climate where considerably lighter buildings can be constructed, while in the USSR industry is shifting to the Northeast; 3) the designing in the Soviet Union in some cases of new industrial plants according to obsolescent technological patterns, insufficiently compact patterns; insufficient use of the possibilities of specialization in auxiliary production; 4) a lag in the organization and mechanization of construction work in the USSR, including unsatisfactory utilization of modern construction methods as well as an excessive number of temporary structures in our construction projects.

The share of expenditures for equipment in the construction of enterprises is evidently smaller than in the reconstruction and modernization of existing plants in which the space and capacity of present buildings are used. Relevant figures for the USA can be derived by comparing census data

for the manufacturing industry on the technological structure of capital investment in new and reconstructed plants with the data on the structure of outlays for new enterprises, published by the Office of Statistical Standards, showing the interrelation between expansion of productive capacity through the construction of new plants and the purchase of new means of production (see following table).

Expenditure for Equipment in US Capital Investment
(in % of total investment)

Branches of manufacturing industry	In new and reconstructed plants (US census data for 1954)*	In new enterprises (data of the Office of Statistical Standards)**
Ferrous metallurgy	71	37
Non-ferrous metallurgy	68	51
General machinery	74	62
Electrical machinery	73	50
Transportation machinery	64	52
Chemical	76	70
Rubber	85	57
Petroleum refining	38***	53
Building materials	71	51
Timber, wood-working, paper	74	59
Textiles	75	71
Leather and leather products	73	41
Food	70	59
Total	69	58

* United States Census of Manufactures, 1954, Vol. I, Summary Statistics, Expenditures for Plant and Equipment, Washington, 1957.

** Capital Requirements for the Expansion of Industrial Capacity, prepared for the Interindustry Economic Research Program by R. N. Grosse, Washington 1953.

*** The Census Bureau instructions for calculating capital investment require that expenditures for oil refining batteries and cracking plants be included in the construction item of capital investment, with the result that the share of equipment in this highly automated sector has been artificially lowered.

The table shows that in the manufacturing industry as a whole the share of equipment in the expenditures for construction of new plants amounts to 58% compared to 69% for the entire category of construction, including reconstruction. Since the census data cover investment in both reconstructed and new enterprises, the actual difference between the share of equipment in the expenditures for new plants and for the reconstruction of existing enterprises is obviously much greater than the 11 points indicated in the "total" row of the table.

Our economic literature cites many instances c the effectiveness of outlays on the reconstruction and expansion of existing plants. Indeed, in the Se en-Year Plan reconstruction and expansion of exi ing enterprises has been adopted as the principal form of increasing capacity. This applies in par- ticular to ferrous metallurgy. It is evident that a saving or a higher yield from production space ca be achieved by replacing obsolescent equipment with new, more compact and efficient machines, a well as by altering the technological schedules of

roduction in other sectors. One article dealing ith the problems of expansion and reconstruction existing plants states that "whereas a few years go the installation of a grinding or turning lathe in machine-building plant required 15 to 20 square eters of space, modern automatic lathes need nly 3 to 5 meters, although their productivity is everal times higher." (3)

This example of a substantial economy of space chieved by replacing old universal lathes by new nes incorporated in automated lines is not typical the whole machine-building industry or even of e mechanical shops. This type of data reflects the otentialities of the latest machinery, potentialities at can be put into effect on a large scale in the ore or less distant future. But the equipment hich is now in mass production also makes it posble to sharply reduce the requirements for proctive space and volume per unit of capacity.

here are convincing examples of this in the textile nd food industries. For instance, the Ivanovo Reonal Economic Council is planning the reconstruction and expansion of 31 factories with an attendant crease of 380,000 spindles and 11,900 looms. The ost of this project is 40% lower than would be the ost of construction of new cotton mills with simir capacity. In the Vinnitsa Economic Region reonstruction of sugar refineries in 1959 expanded eir capacity and they can now process 6,100 tons sugar beet a day more than before. This inolved an outlay of 174 million rubles, while the conruction of new, equal capacities would have cost 40 million rubles. (4) Finally, one of the most riking examples of the high degree of efficacy of econstruction with the use of the latest equipment supplied by the telephone and telegraph communiations systems in which modern electronic deces make it possible to use existing cables for multaneous transmissions of hundreds of essages.

It is evident that the high proportion of expendires for equipment in American industry is due to great extent to the fact that the bulk of capital inestment there is allocated to the reconstruction nd modernization of existing plants. It is not posble to make an accurate estimate of the exact proortion of expenditure for reconstructing existing ants and building new ones because official US atistics do not contain the relevant data either in eriodic censuses or current surveys. On the bas of the available data it is possible to estimate ly the capital investment in uncompleted construcon of new plants and reconstruction of idle ones, hich in 1956 amounted to about 40% of the total pital investment. Expenditures for uncompleted w plants are sometimes mistakenly identified with total outlays for the construction of new plants, and this gives rise to the erroneous idea that capital investment in US industry is almost completely channeled into reconstruction and modernization. Yet according to the data supplied by McGraw-Hill publishers, who make periodic economic surveys, allocations for construction of new plants in 1956 amounted to 35% of the over-all capital investment in industry. The questionnaires filled out by the corporations surveyed by these publishers, which employ 38% of the total labor force in manufacturing industries, indicated that in 1957 they expected to allocate 48% of their capital investment to replacement and modernization of equipment.

It was shown above that in the United States the technological structure of capital investment is subject to considerable variations depending on the phase of the cycle, the aggregate of capital investment and its distribution between construction of new plants and reconstruction of existing ones. It can be generally stated that the technological structure of capital investment depends to a large extent on the rate of growth of production.

Soviet industry is growing at an annual rate of 10-11%, which is 2.8 to 3 times higher than the growth rate of American industry. It therefore stands to reason that in the Soviet Union the share of investment in new plants must be higher than in the USA. In a number of branches — ferrous metallurgy and machine building, for example — the growth is largely due to expansion and reconstruction of existing plants. But in the electric power, chemical, petroleum and gas, and non-ferrous metallurgy industries, on the other hand, the only way to achieve a rapid expansion of capacities is to build new plants.

The work of improving the technological structure of capital investment in the Soviet Union involves certain difficulties owing to the shifting of industry to the East and Northeast. In the USA capital investment is increasingly shifting to the southern and western states where the climate factor reduces the cost of construction, and it is possible to build "open-type" enterprises with few buildings, sometimes even replacing the latter with sheds. Between 1919 and 1954 the total number of enterprises in the manufacturing industries of the USA has increased from 270.2 thousand to 286.6 thousand; in the Pacific Coast states it has doubled, and in California it has increased 2.4 times. The labor force employed in these industries has increased even more. In the USSR, on the other hand, industry is shifting to areas with a markedly continental, harsh climate. It is estimated that the cost of construction in the eastern areas is about 5% higher than in the central regions of the Russian

Federation. True, the impact of these unfavorable conditions of the technological structure of capital investment is mitigated by the fact that construction in the East is focused on super-powerful electric stations and a complex of power-consuming metallurgical and chemical plants, big coal pits, etc., in which the advantages of concentration lower the share of expenditures on construction and assembly work.

In this way the technological structure of capital investment in Soviet industry reflects the impact of the high rate of growth of industrial production and of the specific features of its geographical distribution. Hence, even greater efforts are required for the maximum utilization of modern techniques and advanced methods of construction in the building of new enterprises.

Large-scale use of production lines in all-round mechanization, and in many cases in complete automation, offers many opportunities for achieving greater efficiency in the general programs of new projects. Production lines make possible the economical designing of plant buildings, in particular by setting them up in blocks, reducing the space separating them, and cutting down the length of transportation lines, engineering networks and communications. The Gosstroi Building Administration estimates indicate that by rationalizing general programs a 30 to 40% reduction in the size of plant sites can be achieved, while the length of rail and other transportation lines, engineering networks and communications can be cut by 30 to 40% and 10 to 20% respectively. The contraction of the share of construction in American capital investment is also connected with changes in types of factory structures. Many-storied buildings and warehouses are unsuitable for the huge flow of goods and modern means of transport. Single-story buildings are now used to an increasing extent. They are generally made with all-steel frames and plastic, waterproof ceilings, and flat, corrugated-iron roofing without slope for the outflow of rain. In these structures sectional girders are replaced by shaped metal of different types which are easily installed. Iron and steel works fulfill orders for shaped metal within one to two months. At the same time apparatus is mounted on a vertical pattern which is extensively used in the chemical industry. Certain facilities are planned in a new way in many-storied buildings: staircases, elevators, etc., for instance, are put up outside the buildings.

Besides requiring new types of industrial buildings, automation also offers the opportunity of installing equipment outside the buildings. Recent literature on the subject points out that in the United States in the construction of chemical plants there is a marked trend toward "setting up a central control panel in a separate building; this system combined with large-scale use of insulation materials and stainless steel permits the installation of a substantial portion of the equipment in the open air." (5)

In spite of the harsh climate it is possible both in the Urals and Siberia to set up much of the equipment on open sites, to install it outside the buildings. This is particularly suitable in the chemical industry, ferrous and non-ferrous metallurgy, the building materials industry, etc. The Gosstroi estimates show that in the chemical industry this method will mean a saving in construction costs of 4.5 to 6%.

A considerable saving can be realized in capital investment by an efficient solution of the problem of so-called auxiliary and subsidiary shops, especially of the maintenance departments in new plants. This is not simply a matter of merging, wherever advisable, shop maintenance units into a single plant department, or even of setting up a network of coordinated and regional plants specializing in major repairs. The time has come to change the relation between the outlays of labor for mechanical repairs and the manufacture of new machines in favor of the latter. A partial, say by 0.5 units reduction in the standard norm for the average number of capital overhaulings would permit a lesser degree of stringency in rejecting worn-out and obsolescent equipment and would reduce investment in maintenance shops and, therefore, the aggregate expenditures for construction of new plants.

Finally, another important possibility of economics in construction is the reduction of the number of temporary structures and installations set up on construction sites. In large projects such as new petroleum refineries outlays for temporary buildings and installations run into hundreds of million of rubles, accounting for 8 to 11% of total capital investment in fixed productive assets. The extent of existing possibilities of reducing construction costs can be seen in the plans drawn up by the Ministry of Construction of Electric Power Stations. By increasing the rated capacity of the stations and generating units, by fueling the boilers with gas and heavy oil, and making maximum use of ferro-concrete elements, and by other means as well, the estimated cost of thermal power stations with an aggregate installed capacity of 36.3 million kw. has been cut by 11 billion rubles.

Rational planning of new projects, selection of the best technological construction methods, changes in the branch structure of industry, and in particular, accelerated growth of the chemical industry, are all factors which in the near future

ake possible an increase of about 6 to 7 points in
e share of outlays for equipment. This in turn
ill necessarily bring about a substantial decrease
the capital-output ratio and in the costs of social
roduction, and will help to accelerate the rate of
rowth of the whole socialist economy.

Footnotes

(1) The technological structure of capital invest-
ent (and fixed capital) means the relationship be-
veen the outlays for the purchase and installation
f the working components of fixed capital — ma-
ines and equipment which have a direct effect on
e objects of labor — and the outlays for industrial
uildings. A distinction must be made between the technological and reproductive structure of capital investment: the latter is characterized by the proportion of expenditure for reconstruction and expansion of existing plant to the expenditure for construction of new plant.

(2) R. A. Gordon, "Investment Opportunities in the United States Before and After World War II" (The Business Cycle in the Postwar World), 1955, p. 291.

(3) Planovoe Khoziaistvo, 1960, No. 1, p. 63.

(4) See Promyshlenno-Ekonomicheskaia Gazeta, February 7, 1960.

(5) BIKI Supplement No. 7, 1958, "The Equipment Market in the Capitalist Countries in 1957," p. 84.

***

Planovoe Khoziaistvo, No. 3, 1960

tandard Methodology for Determining the Economic

ffectiveness of Capital Investments and New Technology

n the National Economy of the USSR

The most efficient utilization of capital investents allocated for the reproduction of fixed assets d also the greatest possible increase in the ecoomic effectiveness of new technology are of speal importance in planning the national economic evelopment of the USSR. The 21st Congress of the PSU pointed out in its decisions: "The Commust Party attaches great importance to the most efctive allocation of capital investments which make possible with the least expenditure of funds to inease production capacities, expand industrial outt in the shortest possible periods and achieve a arp rise in labor productivity and a reduction of oduction costs."

The decisions of the Party served as the basis r working out standard methodological rules for termining the economic effectiveness of capital vestments and new technology in the national econny of the USSR. These standard rules, recommended r use in planning, have also taken into accountthe ggestions of the USSR Scientific and Technical Conrence on problems of determining the economic efctiveness of capital investments and new technology.

The standard methodological rules have been elaborated by the Institute of Economics (USSR Academy of Sciences) with the participation of the Scientific Research Institute of Economics (State Planning Committee of the USSR), the Institute of Economics of Construction (USSR Academy of Construction and Architecture), the State Scientific and Technical Committee of the USSR, the Central Statistical Administration of the USSR and the Construction Bank of the USSR. They have been discussed by the Presidium of the USSR Academy of Sciences and, upon its instructions, coordinated with the State Planning Committee of the USSR, the State Scientific and Technical Committee of the USSR, the Central Statistical Administration of the USSR and the Construction Bank of the USSR and approved by the Scientific Council on Problems of the Economic Effectiveness of Capital Investments and New Technology.

The present standard methodological rules for determining the economic effectiveness of capital investments and new technology are designed for use by planning agencies, economic councils,

research and designing organizations, industrial enterprises and building organizations. They incorporate principles which are applicable to all branches of the national economy. These principles should serve as a basis for working out methodological rules by branches, rules which will take into account the specific features of different branches of industry, agriculture, construction and transport.

The standard methodological rules proceed from the premise that the allocation of capital investments among branches of the national economy for the purpose of their balanced and proportional development, with the priority growth of the production of the means of production, is decided on the basis of the balance-sheet method of planning. At the same time the choice of the most effective ways of solving the problems set should be made with due account for the economic effectiveness of the capital investments.

The time factor is of particular importance in determining the effectiveness of capital investments since "in the economic competition with capitalism the question of winning time, the question of time for accomplishing economic tasks is an exceptionally important, vital question" (N. S. Khrushchev).

Calculations of economic effectiveness are made in planning capital investments, designing capital construction projects and introducing new technology:

a) in selecting the branch of production to meet a definite requirement of the national economy when there are several branches producing similar or interchangeable goods;

b) in solving problems related to the integrated development of economic areas and the distribution of new enterprises, specialization, cooperation and combination of production;

c) in establishing the most correct allocation of capital investments among new construction, reconstruction and expansion of existing enterprises and in calculating capacities of enterprises;

d) in establishing construction periods with the object of reducing them and elaborating progressive norms for the duration of construction;

e) in determining capital investments for the introduction of new technology and in working out variants of new technology — the development of new and the improvement of existing types of goods and methods of their manufacture, mechanization and automation of production processes, etc.

The economic effectiveness of capital investments is expressed, in the final analysis, in a growth of the productivity of social labor, i.e., in a reduction of the production cost per unit of output, taking into account the time factor.

The exact determination of economic effectiveness is possible only on the basis of a calculation of value. Since such calculations are not made as yet, indices of prices and production costs, which give an approximate idea of the actual economic effect, should be used to determine economic effectiveness.

In calculating economic effectiveness for the national economy the full expenditure of living labor including labor for society, should be reckoned whenever possible.

Determining the Economic Effectiveness of Capital Investments

Capital investments represent outlays for the reproduction of fixed assets. They are used for the building of new plants, the expansion, reconstruction and re-equipment of existing enterprise the building of installations and other facilities fo production purposes, as well as the construction houses, public utilities, cultural and other servi establishments (including expenses for the purchase of equipment and machines, their moderniz tion, and the introduction of new technological pr esses), for geological prospecting, surveying, de signing and preparatory work and other jobs and outlays.*

In determining the economic effectiveness of capital investments in production projects which tail development of allied branches, account shou be taken not only of the capital investments in the given project but also in the branches needed for its operation. For example, if a thermal electri station is being built, account should be taken of t capital investments not only in the station but als in the fuel industry and in transport on the scale needed to assure its fuel supply. The effect of c ital investments in these allied branches must al be taken into account.

The range of allied branches should be limited and consideration should be given only to the immediate ones which ensure the project with conti uously renewed elements of working capital and require substantial capital investments.

In ascertaining the economic effectiveness of c ital investments in a production project, account should also be taken of the outlays for increasing decreasing working capital.

Capital investments are made with the object c

* In determining the effectiveness of capital investments for production purposes the outlays fo the building of houses, public utilities and cultur and service establishments are not included; the are calculated separately.

panding social production to the utmost, and erefore their economic effectiveness is measured the annual increase in the net product achieved their basis. The index of economic effectiveness the entire sum of capital investments in the na-onal economy is the coefficient of general (abso-te) effectiveness which represents the relation of e increase in the net product (the value of the oduct minus material expenses) to the capital in-stments, of which it is a result. In calculating e effectiveness of capital investments for previ-s years data on the increase in the net product e compared with the commissioned capital in-stments which brought about this increase.

Besides the coefficient of general (absolute) ef-ctiveness of capital investments, to determine e effectiveness of capital investments in enter-ises it is possible to employ a coefficient derived using the index of profitability (E_p) employed in st accounting at enterprises. This is deter-ined by the relation of the difference between the nual output of an enterprise in wholesale prices f the enterprise) and its production costs to total pital investments, according to the formula:

$$E_p = \frac{P - C}{I},$$

ere P is the annual output given in wholesale prices (of the enterprise);

C is the cost of production of the annual output;

I is the total sum of capital investments (taking into account the change in working capital).

Example: Capital investments in the construc-n of a plant (I) are fixed at 400 million rubles. e annual output of the plant in wholesale prices) is 600 million rubles, while the cost of produc-n (C) is 520 million rubles. The coefficient (E_p) this case will be:

$$E_p = \frac{600-520}{400} = 0.2$$

To plan capital investments in branches which oduce interchangeable goods, to choose variants investments in separate enterprises, to settle estions of the distribution of industry, to work t measures for introducing new technology, etc., is necessary to find solutions of economic prob-ms that would lead to the maximum growth in the oductivity of social labor. In all these cases the n is to establish the comparative economic ef-tiveness of the different designing and planning riants in relation to each other and to the exist-enterprises, with the best indices of effective-ss of capital investments for the assigned vol-e of output.

The comparative effectiveness of capital investments is determined by comparing production costs, capital investments per unit of output and the period of recoupment of the capital investments. This period is established by comparing the additional capital investments (i.e., the difference in the variants) and the savings in production costs.

In cases when a variant assures both lower production costs and a saving in capital investments, the question of the period of recoupment of the additional capital investments naturally does not arise.

In such cases it is necessary to take into account the duration of construction and the period required for putting the project into operation.

In determining the effectiveness of capital investments in units of a non-productive character the main index of economic effectiveness is the amount of capital invested per unit of output, with due regard for the need to satisfy the constantly growing requirements of society.

Besides the main value indices of the effectiveness of capital investments, in choosing the most advantageous variants it is also necessary to employ indices in kind, such as those which characterize the productivity of labor (output per worker), expenditure of fuel, power, raw materials, supplies, the utilization of equipment and production floor space, the employment of advanced building designs, etc.

A system of additional technical and economic indices applicable to specific branches should be outlined in the methodological rules for separate branches.

In calculating comparative economic effectiveness in order to choose the most rational variants of capital investments, it is necessary to compare the derived coefficients of effectiveness and the periods of recoupment of the capital investments with the normative indices which are differentiated by branches of the national economy and should be given in the methodological rules for separate branches.

Normative coefficients of comparative effectiveness, differentiated by branches, should take into account the structure of assets and the distinctive features of the given branches, the rates of technical progress in them and the attained level of advanced foreign technology. At present normative coefficients by branches should be established at not less than 0.15-0.3, which is equivalent to periods of recoupment of not more than 3 to 7 years. For some branches (transport, power) longer normative periods of recoupment may be set, but these must not be more than 10 years (a normative coefficient of effectiveness of not less than 0.1).

The establishment of normative indices of economic effectiveness of capital investments in the form of coefficients of periods of recoupment does not mean that all projects which yield a smaller effectiveness may be accepted on other grounds, specifically, considerations of labor protection and improvement of working conditions.

The period of recoupment, or coefficient of comparative effectiveness of capital investments, is determined by comparing the variants of planned and existing enterprises, the types of new technology, or the planned variants with one another according to the formulas:

$$\frac{I_1 - I_2}{C_2 - C_1} = T, \text{ or } \frac{C_2 - C_1}{I_1 - I_2} = \frac{1}{T} = E$$

where I_1 and I_2 are capital investments in the variants being compared;

C_1 and C_2 are the production costs of the annual output in these variants;

T is the period of recoupment of the additional capital investments;

E is the coefficient of comparative effectiveness.

Example: Two variants of a design for the building of a new machine shop are submitted. In the first variant capital investments are fixed at 25,000,000 rubles with a cost of production of the annual output of 35,000,000 rubles. The second variant calls for the use of automatic production lines, which raises the sum of capital investments to 30,000,000 rubles; but the cost of production of the same annual output will be 33,000,000 rubles.

The period of recoupment of the additional capital investments under the second variant as compared with the first will be:

$$\frac{30,000 - 25,000}{35,000 - 33,000} = \frac{5,000}{2,000} = 2.5 \text{ years},$$

or a coefficient of comparative effectiveness of

$$\frac{1}{2.5} = 0.4.$$

Comparing this coefficient of 0.4 with the normative coefficient established for this branch (0.2), we find that the second variant is economically more effective than the first.

In comparing variants with different volumes of output, the sum of capital investments and the production costs of the annual output should be adjusted for a comparable volume of output.

In comparing several variants (more than two), the number and complexity of the calculations increases. In such cases it is advisable to employ the following formulas, in which the best variant will be determined by the smallest sum of outlays:

$$I_1 + T_o \times C_1 = \text{minimum, or } C_1 + E \times I_1 = \text{minimum},$$

where I is the capital investment in each variant;

C is the cost of production of the annual output for the same variant;

T_o is the normative period of recoupment for the given branch;

E is the normative coefficient of effectiveness for the given branch.

Example: Three variants of a technological process of manufacturing parts are submitted with the following indices of capital investments (I) and annual production costs (C):

Variant 1 — I_1 = 1,000,000 rubles; C_1 = 1,200,000 rubles;

Variant 2 — I_2 = 1,100,000 rubles; C_2 = 1,150,000 rubles;

Variant 3 — I_3 = 1,400,000 rubles; C_3 = 1,050,000 rubles;

In this branch of industry the normative recoupment period is five years, or the normative coefficient of comparative effectiveness is 0.2.

To pick the best variant the following calculations are made (in thousand rubles):

variant 1:

1,000 + (5 x 1,200) = 7,000, or 1,200 + (0.2 x 1,000) = 1,400

variant 2:

1,100 + (5 x 1,150) = 6,850, or 1,150 + (0.2 x 1,100) = 1,370

variant 3:

1,400 + (5 x 1,050) = 6,650, or 1,050 + (0.2 x 1,400) = 1,330

The third variant is the best because it gives the smallest outlays.

In comparing variants, if they differ according to the duration of construction, account should be taken of the economic result of shortening or lengthening the period of building and commissioning. This economic result is reckoned on the basis of the average effect which can be obtained in the given branch if the capital investments are employed productively.

If in the submitted variants the capital investments are scheduled for different times, the variants should be compared by converting the expenses of later years to current expenses, dividing them by a coefficient which takes into account the average effect which can be obtained in the given branch by the productive use of the capital investments.

Coefficient (I_{pr}), which takes into account the average effect that can be obtained in the given branch by the productive use of capital investments is determined according to the compound interest formula:

$$I_{pr} = (1 + E)^t,$$

here E is the normative coefficient of effectiveness in the given branch;

T is the period of time in years.

In cases in which the change in the period of construction or the difference in time of the capital investments is only a few years, coefficient I_{pr} can e determined according to the formula for simple terest: $I_{pr} = 1 + ET$.

Example: The sum of capital investments in uilding a two-way bridge is given at 20 million ubles in one variant. The other variant calls for uilding the bridge in two stages with capital investents of 15 million rubles in the first stage and of million in the second stage, but three years later, total of 22 million rubles, or 2 million more than the first variant.

In comparing the two variants, the investments the second stage should be converted to current xpenses, dividing them by the coefficient I_{pr}. The ormative coefficient of effectiveness in the given anch (E) is 0.15.

Coefficient I_{pr} in this case will be:

according to the compound interest formula $(1 + 0.15)^3 = 1.52$;

according to the simple interest formula $1 + (0.15 \times 3) = 1.45$.

By dividing the capital investments in the second age — 7 million rubles — by the coefficient for mpound interest (1.52) we establish that when educed to current outlays they amount to: 7 million rubles: 1.52 = 4.6 million rubles.

Thus, the sum of investments under the second riant will be 15 million +4.6 million = 19.6 million rubles, or 0.4 million rubles less than under e first variant.

Distinctive Features of Determining the Economic Effectiveness of New Technology

The decisions of the June Plenary Meeting of the entral Committee of the CPSU pointed out that in veloping and introducing new technological processes, machines, equipment and building elements is necessary to proceed in the first place from e premise that they must meet the requirements the most rational and economical use of social bor and material and money resources, ensure increase in output, improve the quality and reduce the production costs of output, raise labor oductivity, ease working conditions and make em more healthful, facilitate the observance of fety rules, expedite construction and reduce its st, and cut the period of recoupment of capital investents as compared with the best achievements of viet and foreign science and technology.

The introduction of new technology encompasses the following technical measures which are designed to surpass, in their technical and economic indices, the technology already being applied in the Soviet Union and in other countries, namely:

a) development of new models and improvement of the designs of machinery, equipment and instruments which are already being produced and applied;

b) modernization of equipment in operation;

c) development of new types of materials, fuel and power;

d) improvement of the physical, chemical, and other properties of output and the assortment of output;

e) unification and standardization of models, sections and parts;

f) development of improved types of buildings and installations;

g) new technological processes, mechanization and automations of jobs and processes, advanced methods of organization of production, specialization and cooperation of production.

All measures for the introduction of new technology should be compared with the best analogous models of foreign technology. Inasmuch as the use of foreign currency exchange rates does not yield proper price relationships, these relationships must be analyzed.

The economic effectiveness of the introduction of new technology is determined with the help of the above-mentioned value and natural indices of the comparative economic effectiveness of capital investments.

The economic effectiveness of developing new or improving the existing models of machinery, equipment and other production instruments is realized in the places where they are applied or operated and is determined by the reduction in production costs or the cost of the jobs performed with the aid of these instruments of production.

If the cost of manufacturing these instruments of production is cut, it is necessary to take into account the resulting effect both on the manufacture and on the operation of these instruments, that is, the effect on their users.

If the cost of the instruments increases, it should be regarded as involving additional capital investments for the users and compared with the reduction in their current expenses.

In determining the economic effectiveness of measures for the introduction of new technology the following two questions must be answered.

1) to what extent is the given measure technically and economically advanced and should it be introduced;

2) what is the magnitude of the effect which the national economy will receive from the application of this measure under certain concrete conditions.

For an answer to the first question the starting point for comparison should be the best technology already designed and approved, and also the best Soviet and foreign technology which is already in operation.

To obtain an answer to the second question, the economic effectiveness of projects accepted for introduction should be determined by a comparison with the performance indices of the technology to be replaced. If the development, introduction and mastery of the new technology is to take several years, it is necessary to adjust all the economic indices of the base year, taking into account their changes up to the time the new technology is introduced. To make the indices of a project and of existing technology comparable in case of a change in the volume of production, corrections should be introduced in the latter indices, taking into account the change in the fixed assets and production costs caused by the change in the volume of output.

Measures for the introduction of new technology and especially mechanization and automation measures are carried out comprehensively as a rule with a resultant expansion of production, changes in the goods produced and their quality, more thorough specialization and cooperation, etc. That is why, together with establishing the economic effectiveness of the entire range of measures, it is necessary to make a differentiated analysis of the economic effectiveness of each measure on the basis of instructions given in the methodological rules for various branches.

In determining the economic effectiveness of introducing new types of products or new technological processes on the scale of entire shops (or other large departments), it is necessary to make comparisons of the full cost of production, including all its components. When introducing measures for the improvement of technological processes at separate sections of production, the change in production costs should be determined only for the expense items affected by the new measure, whether a reduction or increase in costs is involved.

Proceeding from the basic task — to steadily raise the productivity of social labor — calculations of the reduction in production costs in new designs should take into account not only the saving in living labor, but also the saving in materialized labor, which is acquiring ever greater significance as the technical level of production rises.

This is particularly important in determining the effectiveness of mechanization and automation involving a reduction in the number of employed workers (living labor) by introducing mechanizati and automation devices (materialized labor).

To ascertain the saving in living labor, the pro jected labor outlays per unit of output should be compared with the actual labor outlays under the existing technological process. If the project cal for an expansion of the production program, the i dices of labor outlays per unit of output in the existing production process should be adjusted fo the planned volume of production. Similarly, thes indices should be adjusted if existing production processes have been mastered. Calculation of wages in production should be made on the basis basic wage rates with due account for the additio earnings of piece workers.

The savings on basic materials and purchased items are determined by comparing the projected quotas with the expenditure quotas at existing ente prises or with the actual outlays if they are belo the quotas. Materials are calculated according t present price lists. Transport and procurement penses of enterprises should be reckoned in amou which are actually spent for various materials.

If there are changes in the volume of freight transportation the savings (or increased cost) should be established on the basis of existing frei rates.

In cases when the project provides for substan tial changes in the outlays for various materials and articles or for power and transportation, the prices and rates of which include the turnover ta or higher accumulations, the saving should be est lished on the basis of the production costs of thes materials, articles and power, and the cost of tra portation plus the average rate of accumulation i the given branch.

Changes in overhead costs should be calculate not proportionately to the basic production wages (or direct costs in construction) but for individua items.

If the volume of production is increased as a r sult of the introduction of new technical measure the relative saving on the constant part of overhe costs is determined. If there is a substantial in crease in output the relative saving is determine by comparing the projected estimated overhead costs.

The annual saving on current expenses in appl ing a technical measure should be determined fo the project on the basis of the contemplated prod tion costs and the volume of output envisaged in plan. In determining the actual annual saving aft the introduction of the measure, the annual avera for a number of years after the measure is intro duced should be established.

The economic effectiveness of new technology

ıould be determined at all stages of designing and troduction. At the stages before and during degning it should be calculated in order to ascertain what extent the planned new technology is adnced and efficient. For that reason it should be mpared with the best available technology. At the e-designing stage calculations should be made to termine the expediency of designing the new techlogy.

In evaluating equipment already being manufacred, the outlays should be established on the basis the price lists. Evaluation of equipment not yet oduced should be made on the basis of the plant's timated cost of production, taking into account the antity (extent of serial production) in which the its are to be produced and the rate of accumulaon. To avoid an excessively high evaluation of uipment produced in single units, the estimate ıould be made on the basis of existing prototypes equipment, with adjustments for complexity, eight, quantities in which they are produced, etc.

Initial outlays for research and designing work d also above-quota outlays for the assembly and tting up of new models of equipment which can be ed for designing other projects should not be inuded in capital investments when determining efctiveness. The cost of designing and experimenl work which pertains directly to the given projt should be added to the sum of capital investents.

In introducing new technology at an existing enterise it is necessary to settle the question of the ed assets which are not utilized in the project inlving the new technology. If these assets (equipent, etc.) can be efficiently utilized at other secons of production, the replacement of the old chnology by the new will not result in any loss. If rt of the fixed assets will have to be scrapped or eir further use is problematical, that part of their iginal cost which has not yet been covered by deeciation should be covered by the saving from the troduction of the new technology and, consequently, ıould be added to the sum of additional capital instments.

These methodological rules are also designed to tablish the economic effect on the basis of which nds are allotted to an enterprise in accordance th the "Regulations on premiums to workers in dustry, construction, transport, communications, ate enterprises in agriculture, scientific rearch, designing, technological, surveying and ological prospecting organizations for the development, production and application of new technology and new technological processes and also for the over-all mechanization and automation of production."

In this connection the calculation of the economic effect should be made as follows:

a) in cases when premiums are to be given for technical measures not involving capital investments or a change in the volume of fixed assets, the economic effect of the measure is determined by the reduction in the production costs of the annual output, or in the cost of the annual volume of building, transport or other work performed;

b) in cases when the premium is to be given for a technical measure requiring additional capital investments or a change in the magnitude of fixed assets, this should be taken into account in determining the total economic effect. For this purpose it is necessary to utilize the method of determining the expenses incurred according to the formula C + EI indicated in the present methodological rules. The figure obtained should be compared with the analogous figure of the other variant. The difference in expenses between the variants constitutes the sum of the economic effect, and is the basis for calculating the amount of the premiums. The calculation is made the same way if the contemplated variant calls for smaller capital investments.

Example: In the existing production process the fixed assets of the section amount to 1,000,000 rubles and the production costs of the annual output are 2,000,000 rubles.

The new proposal calls for automating the section. The fixed assets will increase to 1,500,000 rubles and the production costs of the annual output will be cut to 1,750,000 rubles.

The normative coefficient of economic effectiveness in the given branch is 0.2. The economic effect of the new proposal is determined as follows:

existing process — 2,000,000 + (0.2 x 1,000,000) = 2,200,000;

new process — 1,750,000 + (0.2 x 1,500,000) = 2,050,000;

the economic effect is 150,000 rubles.

The new standard methodological rules should be taken by research and designing organizations, on instructions of the USSR Academy of Sciences, the State Planning Committee of the USSR, ministries and departments, as the basis for working out methodological rules for various branches, rules for determining the economic effectiveness of mechanization, automation, etc.

Sotsialisticheskii Trud, No. 4, 196

E. TORGONENKO:

The Transition to a Seven-Hour Working Day and the Adjustment of Wages in Construction

The chief role in the solution of the immense tasks envisaged by the Seven-Year Plan of national economic development in the sphere of capital construction is assigned to the further growth of labor productivity. This will be achieved by increasing the level of industrialization and mechanization of construction, improving the technology of production and the organization of labor and wages.

The existing seven-category wage scale in construction, with the ratio of the highest to the lowest wage rates set at 1:2.8, no longer corresponds to the requirements of modern production and the level of the workers' skills.

The assignment of building trades workers to the first two categories of the wage scale in conformity with the Uniform Wage Scale and Job Classification Manual has been practically abandoned. Moreover, in construction today there are two wage rates for the first category of the scale, differing by 14%. These rates were set for construction projects of the first and second groups depending on the department to which they were attached. The labor of workers engaged in capital repairs is paid according to the norms and rates fixed as long ago as 1940-1944, i.e., lower than on construction sites in the second group. Apart from this, the progressive piece-rate system does not apply to this category of workers. All this has led to a marked difference in remuneration for workers performing the same job. The low level of wage rates and the existing wage scales do not sufficiently stimulate a rise in labor productivity.

Remuneration of managerial and engineering-technical personnel and employees engaged in construction and capital repairs is based on standard-type schemes of occupational rates ratified in different periods by various ministries and departments. Often enough the numerous schemes of occupational rates now being used do not correspond to the volume of work performed by a building organization.

All departmental building and assembly organizations are divided into two groups — general construction and specialized construction. The uniform indices for remunerating the labor of the managerial and engineering-technical personnel a employees of specialized organizations were set 20 to 40% below those fixed for general construction organizations. Thus, the administrative and engineering-technical personnel of a trust perfor ing labor-consuming finishing operations receive the same remuneration as the personnel of a trus engaged in steel assembly operations and doing th same volume of work. In the Central Gas Supply Department system the occupational rates for the administrative and engineering-technical person of building organizations are fixed independently the volume of work done. For instance, the salar rates of the manager and chief engineer of Buildi Trust No. 5 in Rostov-on-the-Don, with an annual volume of work reaching 140 million rubles, amo to 2,500-2,700 rubles a month. Similar rates are fixed for the manager and chief engineer of Build ing and Assembly Trust No. 2 in Astrakhan, with a annual volume of work amounting to 43 million rubles.

According to the scheme of occupational rates operative in the Ministry of Power Station Constr tion the managerial and engineering-technical pe sonnel employed at various building projects are classed within a "special category" which actuall includes building trusts with a volume of work ranging from 30 to 300 million rubles a year.

These shortcomings in the pay of managerial a engineering-technical personnel have hindered th merging of numerous small building organizatio and prevented the further specialization of const tion. As a result of this nearly 25% of all buildi and assembly organizations operating today have an annual volume of work which does not exceed million rubles. With the present level of technic equipment these organizations employ from 70 t

0 workers and from 10 to 15 administrative work-
s and technicians.

In conformity with the decision of the Central
ommittee of the CPSU, the Council of Ministers of
e USSR and the All-Union Central Council of Trade
ions on completing the transition to the seven-
d six-hour day and adjusting the wages of work-
s and employees in all branches of the Soviet na-
onal economy, it is planned to complete the trans-
r of all construction workers to a shorter work day
d a new wage scale in 1960. Beginning with the
cond quarter of 1960 this transition will go into
fect first of all for building workers employed in
e North, the Far East, Siberia, the Urals and the
azakh SSR. In the rest of the country the transi-
on to the seven-hour day will begin in the fourth
arter of 1960.

In adjusting wages it is planned above all to create the necessary conditions for a correct organization of the wage system, to increase the relative importance of basic wage rates in total earnings, to further increase the wages of the lower-paid workers and employees and to lessen the gap between the higher and lower paid categories.

An important factor in the solution of these tasks is the introduction of a new uniform wage scale and wage rates making it possible to apply technically substantiated output quotas on a broad scale and to establish proper relationships in the pay of workers in various professions and skills. A uniform six-category wage scale with the ratio between the highest and the lowest rates equal to 1:2 and the following hourly basic rates will be fixed for workers employed in construction and building-repair operations:

***

Wage Categories

	I	II	III	IV	V	VI
Basic wage rates (rubles)	3.20	3.70	4.25	4.88	5.62	6.40

These wage rates are being introduced both for
ece and time-rated workers performing all types
building operations. The new wage scale con-
derably narrows the gap now existing between the
ges of the higher- and lower-paid categories of
rkers. It is intended to increase the relative im-
rtance of basic wage rates in the total earnings
piece workers to 80% and simultaneously to
ise the output quotas by an average of 20%, in-
ding a 13.8% rise in the uniform output quotas.
Higher basic wage rates will make it possible to
without the economically ineffective progressive
ece-rate system which was formerly applied on a
de scale. Direct piece rates will become the ba-
c system of labor remuneration.

To stimulate the workers' material interest in
creasing labor productivity, improving the qual-
of output, reducing construction periods and
vering the cost of building and assembly opera-
ns, bonuses of 0.5 to 1% of total piece work earn-
s are provided for each per cent reduction of the
ndard time norm. Piece work assignments can
fixed both for the complex and specialized build-
teams, links, and for individual workers employed
the most important projects and operations. The
t of these projects and operations is approved by
chief of the building and assembly organization.

The complex teams as well as teams paid by the finished job will be issued bonuses for the economies of building materials relative to expenditure norms and for the good maintenance and careful use of prefabricated parts and units. Up to 40% of the sum resulting from the economies of materials and up to 0.2% of the value of the assembled parts and units in the prices used in building estimates can be allotted for this purpose.

The time-rated workers are to receive bonuses for high-quality and timely fulfillment of their assignments on condition that the monthly plan of building and assembly operations is carried out by the foreman or superintendent sections. For instance, the operators of machines and mechanisms will receive bonuses amounting up to 25% of their basic wage rates if they ensure uninterrupted servicing of production sectors without any avoidable accidents or stoppages. The mechanics engaged in repairing and servicing of machines and mechanisms will be issued bonuses amounting up to 20% of their basic wage rates if they ensure uninterrupted servicing of production sectors without any avoidable accidents.

The new bonus system can be introduced only in those sectors in which proper accounting of production indices entitling workers to additional

remuneration is established. The size of the bonuses is fixed by the head of the building organization jointly with the trade union committee. The heads of building organizations have the right to deprive individual workers of bonuses altogether or reduce their size for certain acts of negligence (careless attitude to materials, violation of technical rules, unsatisfactory utilization of machines and mechanisms, absenteeism, etc.). However, the workers can be deprived of bonuses only for the period during which acts of negligence or absenteeism took place. This is recorded by issuing a special order signed by the head of a building organization and indicating the reasons for withdrawing or reducing the bonuses.

Apart from this both piece- and time-rated workers are entitled to bonuses for the commissioning of major projects within the stipulated time or ahead of schedule. For this purpose 60% of the total amount of bonuses are allocated to the best workers, with the size of the bonus paid to the worker in the given month not exceeding 75% of his basic wage rate. The total amount of monthly bonuses paid to workers cannot exceed 40% of the wages earned by piece workers or the basic wage rates of time-rated workers.

Team leaders performing the job of a worker in capital construction now receive additional remuneration amounting to 3% of the total wages earned by the team (not counting progressive piece rates and bonuses), but not more than 500 rubles a month. This system of additional remuneration does not extend to the team leaders in charge of repair operations, which puts them at a disadvantage. In the process of carrying out wage adjustment measures this inequality will be eliminated. All team leaders performing the job of workers whose teams comprise not less than 10 men in general construction and complex operations and not less than 6 men in special-type and assembly operations will receive additional remuneration amounting to 2% of team earnings (excluding bonuses), but not more than 400 rubles a month. To stimulate a further rise in labor productivity this additional remuneration will be issued only if the entire team fulfills the average monthly output quotas.

The adjustment of wages in construction will be accompanied by the introduction of a new wage scale and job classification manual which will take due account of the latest achievements in engineering, production technology and labor organization. The new manual provides a detailed classification of construction jobs and workers beginning with the first wage category.

The construction of projects extending over large areas (trunk, electrification and communication lines, etc.) requires a constant shifting of workers and engineering-technical personnel. This involves additional expenses on their part. In some of the departments these expenses were partially compensated by paying the personnel of building organizations from 20 to 35% of their piece work earnings or basic wage rates (salary rates), while in some cases there was no compensation at all. With the adjustment of wages there will be a uniform procedure for compensating such expenses b paying the workers, engineering-technical personnel and employees 40% of their basic wage rates (salary rates) in the areas of the Far North and comparable localities, and 30% in the other parts of the country, but not more than 26 rubles a day.

Substantial changes are being introduced in the system of remunerating managerial and engineering-technical personnel and employees. A uniform schedule of occupational rates is provided for managerial personnel. All building organizations will be divided into four groups as regards the remuneration of managerial and engineering-technical personnel. Each building organization will be classified in a definite group depending on the annual volume of building and assembly operations (in money terms) as well as on the complexity of those operations and the amount of labor required for their fulfillment.

The following groups are established for all building and assembly organizations (specialized and building-repair organizations) depending on the volume of work specified in the annual plan (in millions of rubles in current building-estimate prices; see table on the following page).

In the case of general-construction trusts and departments the basis for assigning them to a group for purposes of remunerating managerial and engineering-technical personnel is determine by the annual plan of building and assembly operations (according to the general contract); in the case of mechanization trusts and departments, by the annual machinery-operation plan (in money terms) and the plan of building and assembly work carried out by their own labor force; and in the case of the other subcontracting organizations, by the annual plan of building, assembly and repair operations carried out by their own labor force. In view of the fact that individual building organizations perform operations which differ widely in complexity and labor requirements, it is advisable to apply correction factors to their annual volume of work. Thus, for organizations engaged in assembly operations on trunk oil-and-gas pipelines, where labor requirements are considerably lower than in general-construction operations, the correction factor is 0.85, while in the case of organizatio

	Groups			
	I	II	III	IV
Trusts, building departments (with the rights of trusts) and similar-type organizations	Over 200	Over 120 to 200	Over 70 to 120	From 50 to 70
Building (including specialized), building-assembly, assembly, mechanical repair, adjustment, construction mechanization departments and other similar-type organizations	Over 40	Over 25 to 40	Over 15 to 25	From 10 to 15

erforming labor-consuming and technically com-ex jobs of assembling automation facilities the orrection factor is fixed at 1.5. With the introduc-on of this classification system the managerial nd engineering-technical personnel performing the ost arduous or complex types of operations will e placed in an advantageous position as regards eir wages. For example, the trust in charge of elding and assembly operations on trunk oil-and-as pipelines, whose annual volume of work amounts 130 million rubles, will be placed in Group III 30 x 0.85 = 110.5 million rubles) as regards the emuneration of managerial and engineering-techni-l personnel, whereas the trust engaged in assem-ing automation facilities and having the same nual volume of work will be placed in Group II 30 x 1.5 = 195 million rubles).

The correction factors for individual types of erations will be applied to the total volume of ilding and assembly operations only in cases hen basic operations account for not less than % of the organization's annual plan. For exam-e, the trust for the assembly of technological uipment has an annual plan of work amounting to million rubles, including 19 million rubles for e installation of equipment and 3 million rubles r the assembly of steel parts and units. The ba-c type of operation for this trust is mechanical-sembly work, which accounts for more than 75% the over-all plan. In this case the correction ctor is applied to the total volume of work: 22 1.15 = 25.3 million rubles. In accordance with ese indices the trust belongs in Group II.

Building-repair organizations, as a rule, are multaneously engaged in new construction. This ecific feature explains why a special procedure r applying correction factors has been established for them. The 1.5 correction factor will be applied in these organizations only to the volume of building-repair operations, irrespective of their percentage in the annual plan. For example, the plan of a building-repair trust amounts to 20 million rubles, of which 12 million rubles are accounted for by capital repairs and 8 million rubles by new construction. This trust will be placed in Group II on the basis of the following indices: (12 x 1.5) + 8 = 26 million rubles.

Building-assembly and building-repair departments as well as other similar-type organizations with an annual volume of building and assembly operations below the indices specified for Group IV, but not less than 8 billion rubles, will be set up only as exceptions. The managerial and engineering-technical personnel in these organizations will be paid at the level of rates provided for Group IV. Individual building projects or construction areas with an annual volume of work below 8 million rubles, but not less than 4 million rubles, can set up cost-accounting sections in charge of superintendents or senior building foremen, with the number of administrative-managerial personnel not exceeding 5 persons.

With the introduction of the new pay system, only the salary rates of the leading managerial personnel (managers, chief engineers and department heads of trusts and organizations) will be fixed according to the group classification of the given organization.

The engineering-technical personnel (senior engineers, engineers, senior economists, economists and technicians) and the office workers of building-assembly and building-repair organizations will be paid in accordance with a uniform salary scale, irrespective of the group

classification of their organization. This will considerably reduce the gap now existing between the wages of the lower- and higher-paid categories.

A uniform schedule of salary rates irrespective of the group classification of a building-assembly or building-repair organization is also being introduced for field engineering-technical personnel (senior foremen, superintendents, foremen, section mechanics). Considering that the field engineering-technical personnel are directly in charge of construction operations and it is primarily on them that labor and production organization depends, their wages will directly depend on the fulfillment of the program of building and assembly work. If the monthly plan is not fulfilled the salaries paid to field engineering-technical personnel will be proportional to the percentage of plan fulfillment, but not less than 90%.

The new pay system will likewise be extended to field engineering-technical personnel in capital construction departments and organizations which conduct building operations on the cost-accounting principle. At the present time special zonal coefficients are applied to the wage and salary rates of workers and field engineering-technical personnel engaged in capital construction, depending on the geographical location of construction projects. However, this procedure does not extend to the managerial personnel of building organizations. Hence, under the present system of occupational rates civil engineers working in Moscow and in Omsk are paid at the same rates.

With a view to unifying the wage system for workers, engineering-technical personnel and employees (irrespective of the character of work), uniform zonal coefficients will be applied to the wages of all personnel, i.e., to their total piece or time-work earnings with due account of bonuses and additional payments for working hours, except extra payments for work in the Far North and similar localities in all economic areas. If monthly earnings exceed 3,000 rubles the zonal coefficient is applied only to 3,000 rubles. Uniform rules will be established for raising zonal coefficients for the personnel of organizations engaged on construction projects in alpine areas as well as in the desert and arid zones.

With the introduction of the seven-hour day and the new pay system in building-assembly and building-repair organizations, the payment of long-service bonuses and all kinds of additional remuneration established for individual construction projects will cease.

The new pay system in construction does not cover workers, employees, managerial and engineering-technical personnel employed in industrial enterprises, power stations, lumbering and rafting, rail, water and motor transport, municipal economy, trade and public-catering establishments and children's institutions encompassed in building-assembly and building-repair organizations. New pay systems in these enterprises, organizations and institutions will be introduced in accordance with t schedules and procedures envisaged for the respec tive branches.

The introduction of the seven-hour day and the new pay system in the construction industry is greatly facilitated by the availability of the Uniforr Wage Scale and Job Classification Manual and the unification of output quotas and piece rates. However, this does not obviate the need for a great dea of preliminary and explanatory work. The transition to the seven-hour day and the new pay system in construction will require the further extension c over-all mechanization, the extensive application c prefabricated parts and mechanized, conveyer assembly of buildings from large prefabricated elements and units. This will make for higher labor productivity and a greater volume of production. Each building organization must work out concrete plans of organizational and technical measures ensuring the transfer of workers to a shorter work da without any reduction in labor productivity. Apart from the personnel involved in setting wages and output quotas, the entire personnel of building organizations must be enlisted in the work of elaborating these plans. Particular attention ahould be devoted to measures designed to reduce intra-shif stoppages and losses of working time, introducing advanced labor methods and production technology lowering the number of auxiliary and subsidiary workers, etc. The time-study data show that intra shift losses in construction still amount to 15 to 18%.

It is necessary to set up job classification commissions comprising people with a good knowledge of production, outstanding workers and representa tives of trade union and Party organizations. Job classification must not be reduced to the mechanical process of transferring workers from a higher wage category in the old seven-category scale to a lower one in the new six-category wage scale. Th job classification commission must examine and carefully consider the wage category assigned to each individual worker and, when necessary, enab each worker to take a special qualification test in strict conformity with the production characteristics contained in the Wage Scale and Job Classific tion Manual for the corresponding profession and skill.

The heads of building organizations as well as Party and trade union organizations must ensure that appropriate instructions are given to field

gineering-technical personnel, wage experts and te-makers who are directly responsible for carry- g out these highly important measures. It is par- cularly important to exercise systematic super- sion over the implementation of all organizational d technical measures from the very first day that e new pay system is introduced. Leading workers ust play an active role in this supervision.

A considerable rise in labor productivity and onomies in the wage fund can also be achieved by rther improving the system of construction manage- ent through merging and zoning of building organiza- ons, liquidating unnecessary intermediate adminis- ative bodies and reducing the number of managerial d engineering-technical personnel and employees.

All ministries, departments and economic councils must carefully analyze the geographical distribution of their organizations and, where necessary, merge them by liquidating numerous parallel-type organizations with a small volume of work operating in the same area.

Explanatory work is a factor of great importance. The sum and substance of the planned wage adjustment measures, their economic and political significance must be brought home to every worker and employee. The explanatory work must be concrete and understandable in character and should be illustrated with practical examples and calculations of workers' earnings on specific jobs.

***

Sotsialisticheskii Trud, No. 2, 1960

AGANBEGIAN:

ethods of Analyzing and Calculating the Distribution of Workers

nd Employees by the Amount of Wages

The target figures for the development of the SR national economy for 1959-1965 provide for increase in minimum wages from 270-350 to 0-450 rubles a month in the course of wage ad- stments in 1959-1962, and up to 500-600 rubles a nth in 1963-1965. The minimum wages of work- s and employees are to rise by 70 to 80%, with erage wages increasing by 26%. This will pro- de the basis for substantially reducing the wage p between the lower- and medium-paid groups on e one hand, and the higher-paid groups on the oth- . All this will lead to fundamental changes in the tribution of workers and employees by the ount of wages.

The measures taken in the current Seven-Year an are chiefly designed to narrow the wage gap d to make wages more dependent on the results labor. Therefore, the economic indexes charac- izing the reduced wage differentials between e lower-paid and higher-paid groups and the ac- mpanying changes in the distribution of workers' d employees' wages are no less important in the ganization of wages than the indexes of the share basic rates in earnings and the wage structure, e importance of the various forms and systems of wage payment, the introduction of technically sound output quotas, etc. The measures of wage distribution should be calculated for each branch and category of labor, at every state farm, enterprise and institution, that is, everywhere where steps are being taken to adjust wages.

In working out proposals on wage and salary rates, wage scales, bonuses and other features of remuneration, calculations are necessary to show how various factors lessen the gap between the wages of the lower- and higher-paid workers. Furthermore, estimates of the future wage distribution are also essential in preparing certain measures for improving the material well-being of the working people, measures provided for by the decisions of the 21st Party Congress (changes in retirement pensions, abolition of taxation of the population and so on).

All this requires scientific methods of analysis and calculations of the distribution of workers and employees by the amount of wages.

I. Measures Indicating a Decline in Wage Differentials

In most cases a simple comparison of the

distribution of workers by the amount of wages at two dates (before and after the implementation of wage adjustment measures) provides no idea as to whether the gap between the wages of the lower- and medium-paid groups on the one hand, and the higher-paid groups on the other, increased or decreased, to say nothing of how much it decreased.

Let us compare, for example, the distribution of industrial workers by the amount of wages in 1929 and 1934, i.e., before and after the wage reform of 1931-1933 (% of workers in various wage intervals)*:

	March 1929	October 1934		March 1929	October 1934
Total number of workers	100.0	100.0	90-110 rubles	15.0	12.7
			110-130 "	9.4	14.3
Including those with monthly wages of:			130-150 "	5.8	13.3
			150-170 "	1.8	10.6
up to 30 rubles	2.3	—	170-200 "	4.1	11.9
30-50 "	15.2	0.8	200-250 "	1.3	12.0
50-70 "	23.6	2.6	250-300 "	0.4	6.6
70-90 "	21.1	7.9	more than 300 "	—	7.3

* TsUNKhU, Statisticheskii spravochnik, Narodnoe khoziaistvo SSSR, pp. 460-463; TsUNKhU, Zarabotnaia plata rabochikh krupnoi promyshlennosti v oktiabre 1934, 1935, pp. 298-299.

Without auxiliary statistical measures it is impossible to determine whether the gap between the lower-paid and higher-paid workers lessened or increased between 1929 and 1934.

To measure the difference between the wages of lower- and higher-paid workers a whole system of indexes is employed. These include first of all the structural indexes of differentiation, the so-called quartiles, quintiles, deciles, etc.

Quartiles (Q) divide the aggregate number of workers according to the amount of their wages into four parts. The wage below which 25% of the workers fall is the first quartile (Q_1). The wage below which 50% of the workers fall is the second quartile, called the median (Med). The wage below which 75% of the workers fall is the third quartile (Q_3);

Deciles (d) divide the aggregate number of workers into ten parts. The first decile (d_1), the second decile (d_2), etc. are distinguished accordingly. The first decile (d_1) indicates the wage level below which 10% of the workers fall, and the ninth decile (d_9) — the wage level below which 90% of all workers fall.

The ratio of the third to the first quartiles $\frac{Q_3}{Q_1}$ and the ratio of the ninth to the first deciles $\frac{d_9}{d_1}$ characterizes the difference between the wages of the lower- and the higher-paid groups of workers. By comparing these ratios over a number of years it is possible to determine whether the wage gap among given groups of workers has diminished or increased.

Let us calculate these indexes for 1929 and 1934

***

	Q_1	Q3	$\frac{Q_3}{Q_1}$	d_1	d_9	$\frac{d_9}{d_1}$
March 1929 (rubles)	56.6	106.7	1.88	42.1	140.4	3.34
October 1934 (rubles)	111.4	203.2	1.82	87.3	276.3	3.17
Changes (%)	197	190	97	207	197	95

This shows that the difference between the wages of the upper and bottom group of industrial workers in 1934 was somewhat less than in 1929. This is also evident from the indexes of the rate of growth

wages: the first quartile and the first decile increased more than the third quartile and the ninth decile between 1929 and 1934.

However, these indexes are inadequate for depicting the changes in the distribution of workers according to wages received. The foregoing table shows that the ninth decile increased more than the third quartile and, consequently, that the earnings of people with the highest wages increased most among the higher-paid groups of workers. Hence, it is advisable to compute all the deciles:

***

	d_1	d_2	d_3	d_4	d_5	d_6	d_7	d_8	d_9
March 1959 (rubles)	42.1	52.2	60.9	69.1	78.0	87.8	99.4	115.3	140.4
October 1934 (rubles)	87.3	104.0	118.4	131.0	147.4	165.6	188.5	220.9	276.3
Changes (%)	207.0	200.0	195.0	190.0	189.0	189.0	190.0	192.0	197.0

The calculations show that the wages of the low-paid groups increased most and of the medium-paid groups the least.

Although the difference between the wages of the lower- and higher-paid workers lessened somewhat, the gap between the wages of the medium- and higher-paid workers increased. This conclusion could not have been derived from the previous table illustrating only the changes of the extreme groups. It follows, therefore, that in certain cases it is essential to calculate not only the ratios between the extreme deciles $\frac{d_9}{d_1}$, but also $\frac{d_5}{d_1}$, $\frac{d_9}{d_5}$, etc.

These changes in distribution are graphically evident if the number of workers is calculated by wage intervals and their wages are expressed as shares of the median (for comparability). Let us present such a calculation for 1929 and 1934:

***

Wage intervals in shares of median	March 1929		October 1934	
	Wage intervals corresponding to shares of median, in rubles (Med = 78 rubles)	Number of workers by wage intervals (in % of total)	Wage intervals corresponding to shares of median, in rubles (Med = 147.4 rubles)	Number of workers by wage intervals (in % of total)
Up to 0.4	Up to 31	2.9	Up to 59	0.9
0.4-0.6	31- 47	11.7	59- 88	4.4
0.6-0.8	47- 62	16.7	88-117	23.1
0.8-1.0	62- 78	18.8	117-147	20.6
1.0-1.2	78- 94	15.4	147-177	15.6
1.2-1.4	94-109	11.0	177-206	10.4
1.4-1.6	109-125	8.1	206-235	7.4
1.6-1.8	125-140	5.3	235-265	5.3
1.8-2.0	140-156	3.2	265-294	3.8
2.0-2.2	156-172	1.6	294-323	1.8
Over 2.2	Over 172	5.3	Over 323	6.7

This table shows that in 1934 the number of low-paid workers (those receiving wages up to 0.6 Med) declined sharply compared to 1929. But at the same time the share of the higher-paid workers (those receiving wages above 1.8 Med) increased.

It is possible to successfully describe the diminishing difference between the wages of the lower- and medium-paid groups on the one hand, and the higher-paid groups on the other, by means of quartiles, deciles and so on. But these indexes

themselves are not precisely connected with the concepts "lower-paid," "medium-paid," "higher-paid"; they mechanically subtract 10 or 25% of the number of lower-paid or higher-paid workers regardless of the amount of their wages. This failing can be removed by applying the method of group averages, i.e., calculating average wages separately for the lower, medium- and higher-paid groups, and comparing them.

Suppose, that as a result of wage adjustments in some particular branch of industry, the distributio of workers by the amount of wages changed as follows (hypothetical figures, % of all workers in given wage intervals):

	Before wage adjustments	After wage adjustments	Changes		Before wage adjustments	After wage adjustments	Change
Total number of workers	100	100	-	700- 800 rubles	13	18	+5
Workers with a monthly wage of:				800- 900 "	11	14	+3
				900-1,000 "	9	10	+1
				1,000-1,200 "	12	13	+1
up to 400 rubles	5	—	-5	1,200-1,400 "	7	8	+1
400-500 "	8	3	-5	1,400-1,700 "	4	4	—
500-600 "	13	11	-2	1,700-2,000 "	2	1.5	-0.5
600-700 "	15	17	+2	Over 2,000 "	1	0.5	-0.5

After the wage adjustments the number of lower-paid workers (those with earnings up to 600 rubles) dropped from 25 to 14% of the total, the number of medium-paid workers (those with earnings from 600 to 1,400 rubles) rose from 68 to 80% and the higher-paid workers (those with earnings exceeding 1,400 rubles a month) dropped from 7 to 6%.

The method of group averages applicable to this distribution consists of the following. The average wage is calculated in the base year (before wage adjustments) individually for lower,- medium- and higher-paid groups. Then the average wage is calculated in the current year (after wage adjustments) for the groups which previously ranked as the lower,- medium- and higher-paid. Finally, these indexes are compared.

Before the wage adjustments the average earnings of the lower-paid workers in our example were approximately 500 rubles, the medium-paid — roughly 850 rubles, and the higher-paid — about 1,700 rubles. After the wage adjustments we must find the average earnings of the 25% of workers with the lowest wages, since before the wage adjustments 25% of the workers were included in the lower-paid category. Their average earnings will amount to 560 rubles. The average wages of the 68% formerly medium-paid workers will be determined in the same way and will equal 920 rubles. The average earnings of the 7% higher-paid workers will amount to 1,600 rubles after the adjustments. Let us now present the derived indexe in a table and calculate their relationship (see tabl on the top of the following page).

We think that these indexes can become the basic statistical data for measuring the difference between the remuneration of the lower,- medium- and higher-paid workers.

2. Indexes Illustrating the Distribution of Workers

The nature of the distribution of workers by the amount of wages largely determines the means an methods used to raise the earnings of the lower-paid workers. This is clearly evident from the diagram shown at the bottom of the following page (in hypothetical figures).

For the same average wage, say 1,000 rubles, for example, the rise of minimum wages to 600 rubles with the first type of distribution will involve roughly 10% of all the workers and in the second case 30%. Hence, expenditures for higher wages under the second type of distribution wi be three times as great as in the first. This clea ly shows the practical significance of the study o the character of a distribution — its skewness, th general differentiation of wages, the dispersion o wages and the like.

To characterize a distribution it is important t

	Before wage adjustments	After wage adjustments	Changes (in %)		Before wage adjustments	After wage adjustments	Changes (in %)
Average monthly wages (in rubles) of workers who before the wage adjustments were:				Difference in wages between:			
				a) higher-paid and lower-paid	3.4 times	2.76 times	81
lower-paid	500	580	116	b) higher-paid and medium-paid	2 times	1.74 times	87
medium-paid	850	920	108				
higher-paid	1,700	1,600	94				

now, not only the magnitude of the average wage, median, quartiles and deciles, but also the magnitude of the mode (Mo). This indicates the most common wage level in the examined aggregate. If the total number of workers is distributed by the amount of wages, with equal intervals (400-500, 500-600, 600-700 and so on), the wage interval with the greatest number of workers will be the modal interval. Before the wage adjustments the modal interval in our example was 600-700 rubles, and after the adjustments — 700-800 rubles. The mode can be computed by the following formula:

$$Mo = 1 + \left(\frac{n_2 - n_1}{(n_2 - n_1) + (n_2 - n_3)} \right) \cdot d,$$

where 1 is the beginning of the modal interval in rubles;
n is the number of workers, in %, in the interval (n_1 — in the interval preceding the modal interval, n_2 — in the modal interval and n_3 — in the interval which follows the modal interval);
d is the magnitude of the interval in rubles.

Let us now calculate the mode.
Before the wage adjustments:

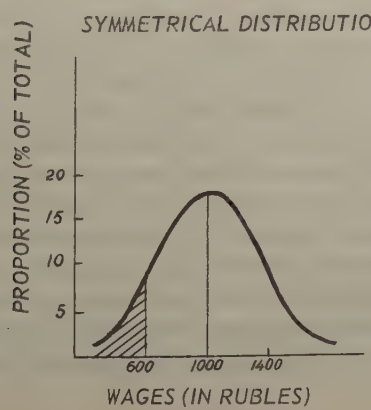
$$Mo = 600 + \left(\frac{15-13}{(15-13) + (15-13)} \times 100 \right)$$
$$= 650 \text{ rubles}$$

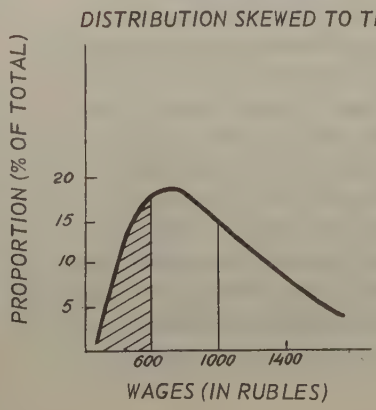
After the wage adjustments:

$$Mo = 700 + \left(\frac{18-17}{(18-17) + (18-14)} \times 100 \right)$$
$$= 720 \text{ rubles}$$

In a distribution skewed to the right (such is the distribution of workers by the amount of wages), the mode will be less than the median, and the median less than the mean. Thus, in the distribution of industrial workers by the amount of wages in October 1934 the modal wage was 123.3, the median wage 147.4 and the average wage 168.6 rubles.

Both the median and mode, or, as they are sometimes called, the structural averages, are more sensitive to changes in the distribution of workers





by the amount of wages than is the average wage. Both the mode and median, as well as the average, characterize the central tendency of the distribution: the mode as the most common wage and the median as the wage below which one half the workers fall (the middle wage).

The deviation of the modal and median wage from the mean characterizes the skewness of the distribution curve: the greater these deviations, the greater is the skewness. In the so-called normal (symmetrical) distribution the mode, the median and the mean coincide. From the point of view of raising the wages of the lower-paid workers the best distribution is the one in which the difference between the modal, median and mean wage is at a minimum.

To characterize the skewness of a distribution of workers by the amount of wages, indexes based on quartiles and deciles may also be recommended:

$$\text{Quartile coefficient of skewness } K_Q = \frac{Q_3 - \text{Med}}{\text{Med} - Q_1}$$

$$\text{Decile coefficient of skewness } K_d = \frac{d_9 - \text{Med}}{\text{Med} - d_1}$$

The advantage of these coefficients is that the differences Q_3-Med, Med-Q_1, d_9-Med, Med-d_1, expressed in rubles, have substantial economic significance, for they show the difference between the median wage (Med) and the wages of low-paid personnel (Q_1 and d_1) and those who are highly paid (Q_3 and d_9).

The table shown on the top of the following page lists the most important of these statistical indexes characterizing the distribution of workers in industry by the amount of wages for various prewar years.

Without going into a detailed analysis of these interesting data we may note that with the transition to industrialization the difference between the remuneration of lower-paid and higher-paid workers did not grow in comparison with the preceding period, but the skewness of the distribution curve became much more marked. This was connected with the transition to wage scales with markedly progressive increases in basic wage rates.

The general differentiation of wages, their dispersion, may be characterized by the mean square deviation (σ) and the coefficient of variation (v). The mean square deviation can be derived in the following way: a) by calculating average wages within the wage intervals (x); b) by determining the deviations of these average values within the wage intervals from the average wages of the whole aggregate ($x-\bar{x}$); c) by squaring these deviations and finding their sum, weighted by the number of workers in the wage intervals ($\frac{\sum(x-\bar{x})^2 m}{\sum m}$); d) by finding the mean square deviation as the square root of the derived sum ($\sigma = \sqrt{\frac{(x-\bar{x})^2 m}{\sum m}}$).

The mean square deviation of the distribution of workers by the amount of wages shows the absolute dispersion of wages around an average level, expressed in rubles. The mean square deviation of the distribution of workers in industry by the amount of wages in October 1934, for example, was approximately 50 rubles, and in March 1929 it was 20 rubles. A comparison of these two values of the mean square deviation is of little significance since these deviations are taken from a varying level of average wages (from 168.6 rubles in 1934 and 74.9 rubles in 1929). We must use a comparable index characterizing not the absolute but the relative dispersion of wages. The coefficient of variation is such a measure.

The coefficient of variation shows the measure of dispersion in shares of the average wage: $v = \frac{\sigma}{\bar{x}}$. For March 1929 it is 27% and for October 1934 it is 29%. The coefficient of variation can be widely used for characterizing the distribution of homogeneous aggregates of workers (of a given skill, under similar labor conditions, the same wage system, etc.), when this distribution more or less closely approaches the normal type of distribution. But this coefficient is less suitable for characterizing wage distributions of heterogeneous aggregates of workers, for, as a rule, they are distinguished by a marked skewness and the average wage in this case is not sufficiently representative of the entire aggregate.

The mean square deviation and the coefficient of variation are widely used in analyzing the distribution of piece workers according to fulfillment of production quotas. The extent of the variations in quota fulfillment in given production sectors makes it possible to evaluate the quality of the quotas and the organization of labor in the sectors. For this purpose we must make a preliminary analysis of quota fulfillment in corresponding production sectors.

The dispersion of wages in the distributions can also be characterized by means of quartiles, quintiles, deciles, etc. For this purpose the quartile index $\frac{Q_3 - Q_1}{\text{Med}}$ is frequently used.

We have here applied these statistical measures of distributions of workers by the amount of wages only for comparing series of distributions in different time periods. This is the most frequently encountered problem in actual practice. However all the examined indexes can be successfully applied to compare series of distributions of workers by the amount of wages in branches,

Indexes	March 1924	March 1925	March 1926	March 1927	March 1928	March 1929	March 1930	March 1934
Average monthly wage ($\bar{x}$) in rubles	37.8	44.2	55.6	62.6	71.5	74.9	83.2	168.6
Median wage (Med) in rubles	33.5	38.9	51.2	58.3	66.7	71.4	78	147.4
Modal wage (Md) in rubles	25.1	29.0	43.3	49.0	54.4	58.6	64.4	123.3
Ratio of average wage to median wage ($\frac{\bar{x}}{Med}$)	1.13	1.14	1.09	1.07	1.07	1.05	1.06	1.14
to the modal wage ($\frac{\bar{x}}{Mo}$)	1.50	1.52	1.29	1.28	1.32	1.27	1.29	1.37
Quartiles in rubles:								
one (Q_1)	22.3	27	35.9	42.3	48.8	53.3	56.6	111.4
three (Q_3)	48.4	54.9	72.6	80.1	91.3	96.9	106.7	203.2
Deciles in rubles:								
one (d_1)	—	—	—	30.8	35.8	40.2	42.1	87.3
nine (d_9)	—	—	—	111.3	130.5	126.1	140.4	276
Coefficients of differentiation of wages:								
quartile ($\frac{Q_3}{Q_1}$)	2.16	2.03	2.02	1.9	1.87	1.82	1.88	1.82
Decile ($\frac{d_9}{d_1}$)	—	—	—	3.62	3.65	3.15	3.34	3.17
Coefficients of skewness of wages:								
quartile ($\frac{Q_3 - Med}{Med - Q_1}$)	1.33	1.34	1.4	1.37	1.37	1.41	1.34	1.55
decile ($\frac{d_9 - Med}{Med - d_1}$)	—	—	—	1.93	2.06	1.75	1.74	2.14

Calculated from data in the following sources: Narodnoe khoziaistvo SSSR za 1928, Moscow, 1929, p. 545; Narodnoe khoziaistvo SSSR v tsifrakh, Moscow, 1925, p. 491; Statisticheskii spravochnik, Narodnoe khoziaistvo SSSR, Moscow, Leningrad, 1932, pp. 460-463; Zarabotnaia plata rabochikh krupnoi promyshlennosti v oktiabre 1934, Moscow, 1935, pp. 298-299.

areas, personnel categories and the like.

Suppose we compare, for example, the statistical indexes of distribution according to personnel categories:*

Personnel categories	Med in rubles	Q_1 in rubles	Q_3 in rubles	$\frac{Q_3}{Q_1}$	$\frac{Q_3-Q_1}{Med}$	$\frac{Q_3-Med}{Med-Q_1}$
Workers (on the basis of data for October 1934)	147.4	111.4	203.2	1.82	0.62	1.55
Engineering-technical personnel (on the basis of data for July 1935)	353	275	482	1.75	0.59	1.65
Employees (on the basis of data for July 1935)	184	152	296	1.95	0.78	3.50

* Calculated from data in the following sources: Trud v SSSR, Statisticheskii spravochnik, Moscow, 1936, pp. 83-84; Zarabotnaia plata rabochikh krupnoi promyshlennosti v oktiabre 1934, Moscow, 1935, pp. 298-299.

The greatest wage differentiation is observed among employees, which is due to the diverse composition of this category, then come workers and finally engineering-technical personnel. From the above we see what an important part the structural and other indexes of distribution can play in the analysis of the distribution of personnel by the amount of wages. While emphasizing the significance of the foregoing statistical indexes we should mention that they rest on external manifestations of the examined phenomenon (in the present case, wages) and cannot in themselves disclose the internal nature of the phenomenon or shed light on the factors which determine the differentiation of wages. This can be solved at the second stage of the analysis of the distribution of workers by the amount of wages — the stage of statistical investigation of the factors and the laws governing wage differentiation. (1)

3. Analysis of the Factors Governing the Distribution of Workers by the Amount of Wages

An analysis of the factors determining one or another distribution of workers by the amount of wages must begin with the preparation of combined tables and groupings revealing the connections among the individual elements in the differentiation of wages and their distribution. The ideal thing would be to prepare a system of groupings which would fully define the composition of the general distribution curve of personnel by the amount of wages.

Suppose we have to investigate the factors responsible for changes in the distribution of workers by the amount of wages stemming from the introduction of new wage provisions in the given branch of production. For this we make the following calculations:

1. The workers within a given wage category who are working under the same conditions and under a uniform system of remuneration are distributed by the amount of their wages. Since the basic wage rate of these workers is the same, the differentiation of their earnings will depend in the case of the time-rated workers only on the magnitude of premiums, and in the case of piece workers upon the fulfillment of the output quotas and the magnitude of bonus payments. Therefore, in the case of piece workers it is best to plot the curve by calculating their distribution according to total earnings and according to basic piece-rate earnings. By comparing the distribution prior to and after the wage adjustments we will observe the changes connected with improvements in the setting of quotas and bonuses. By substituting the previous distribution of workers in a given wage category for the new one in all the combined tables and deriving from them the general distribution of workers according to the amount of wages, we derive the calculated distribution. A comparison of this with the actual distribution of workers by the amount of wages after adjustments will reveal the influence of the above factors (adjustments in output quotas and in the incentive wage systems, as well as the correspondence between the work performed and the wage-scale category of the workers upon the differentiation of wages.

2. We then calculate the average earnings of workers according to wage-scale categories, labor conditions and systems of payment before and after the wage adjustments. In the course of the adjustments the relationships among these indexes change. To reveal the influence of these changes on the distribution of workers by the amount of wages, in the combined tables we list the former average values, leaving all the other factors (including the variation around the averages) unchanged. If we now compare the derived distribution with the actual one, we shall also reveal the influence of this factor.

3. We then determine the distribution of workers according to wage scale categories, labor conditions and systems of payment before and after the wage adjustments. By placing the former values of these indexes in the table of the new distribution of workers according to the amount of wages, we reveal the influence of the reclassification of workers among wage-scale categories, the changes in the list of heavy, hot and dangerous jobs, as well as changes in the number of piece workers and time-rated workers on the wage distribution.

All this can be calculated in greater detail. It is possible, for example, to derive calculated distributions by substituting not one but several factors and thereby determining the combined influence of a number of factors on this distribution.

The great amount of effort this will require is self-evident. It will entail the collection of data not only on wages, their structure, systems of payment, the wage-scale categories of the workers, their labor conditions and the compilation of numerous groupings, but time and again it will mean the recalculation of all the tables, substituting one by one all the factors determining the differentiation of wages. For practical purposes it is quite enough to carry out such an investigation once in some given branch. Having once elaborated in detail the data on the factors determining the distribution of workers by the amount of wages, it will be easy later to use them to evaluate the efficacy of the projected wage scales, basic wage rates,

systems of job classification, system of wage payment and for other purposes. It should be borne in mind that the character of the distribution curve of workers of homogeneous groups (for example, workers within the same wage-scale category) according to fulfillment of production quotas, magnitude of wages and the like is less subject to change than is the case with average indexes. By placing the already calculated distribution curves on new averages it is possible to derive new distributions with sufficient accuracy.

Thus, in working out measures for adjusting wages and further raising minimum wages to 500-600 rubles we can see the significance of special sample studies of the factors governing the differentiation of wages in combination with more comprehensive calculations (in the same branches, areas, groups of workers, etc.) of the distribution of workers and employees by the amount of wages. After conducting such a study it is essential to properly work out the data obtained, correcting the data of the special sample survey on the basis of data from the more comprehensive studies and thereby obtaining fully representative statistical material for the calculations.

If such detailed data are not available an analysis of the factors governing the distribution of workers by the amount of wages can be carried out on a more general level. By comparing the distribution of piece workers according to their fulfillment of production quotas before and after the introduction of wage adjustments (such records are kept for the basic and auxiliary shops), it will be possible to determine the influence of this factor on the differentiation of wages. If we have data on the average wages and number of workers according to wage-scale categories, we can get an idea of the influence of the reclassification of workers and the introduction of new rates and scales on the distribution of workers by the amount of wages. In approximately the same manner it is also possible to determine the influence of changes in the interregional and interindustry wage structure.

4. Methods of Calculating the Projected Wage Distribution

In essence the method of calculating the projected distribution of workers by the amount of wages consists of the following. The distribution of workers according to basic wage rates (separately for piece workers and time-rated workers) is calculated from the data on the first category wage rates, wage scales and the classification of workers among the wage categories. Then the differentiation of earnings is determined for the given rates by taking due account of the distribution of workers according to quota fulfillment and the size of bonuses. In this rough calculation the magnitude of the differentiation is determined in advance, disregarding variations depending on wage categories and assuming an identical differentiation of wages for all categories and all basic wage rates. (2)

Let us illustrate this with an example. If we have the projected basic wage rates for workers by categories and the projected share of the basic rate in the earnings of workers is known, then it will be easy to calculate the magnitude of average earnings of workers by wage categories corresponding to the new wage provisions. Let us assume that the variation of wages around the average level is as follows: 5% of the workers receive wages within the range of 0.4 to 0.6 Med, 18% from 0.6 to 0.8, 26% from 0.8 to 1.0, 22% from 1.0 to 1.2, 12% from 1.2 to 1.4, 8% from 1.4 to 1.6, 4% from 1.6 to 1.8, and 5% of the workers receive wages exceeding 1.8 Med (see table on the following page).

The calculation proceeds as follows: Average wages by wage-scale categories are laid out in intervals corresponding to shares of the median (0.4-0.6 Med, 0.6-0.8, 0.8-1.0, and so on) and the number of workers who are to be classified in the given category are distributed on the basis of the new wage intervals, proceeding from the aforementioned relative shares of this variation. Then all that remains is to transform these intervals into the usual ones (up to 400, 400-500, 500-600, etc.) and to derive the sums.

By comparing the distribution obtained with the actual one for the same aggregate of workers we derive the efficacy of the projected basic wage rates, wage scales and classification of workers.

In making a more detailed calculation we first determine the variation for the basic piece work earnings of the piece workers and only then add to it the bonus payments. The calculations for time-rated workers are done separately and then all this is summed up. It is not at all difficult to take account of regional differences in wages: on the basis of the distribution obtained, all we need to do is to determine the distribution by the amount of wages corresponding to the magnitude of the regional coefficients and to include in them the number of workers paid at these coefficients, and then, after transforming the intervals of the distribution, to sum the results for the country as a whole.

Special mention should be made of the job of determining the variation of output quotas. Using the actual data, we first derive the coefficient of variation for the distribution of piece workers according to quota fulfillment. This varies from 18% in

	Wage Scale Categories							
	I	II	III	IV	V	VI	VII	Total
	Average projected monthly wages (the median) in rubles							
	550	650	720	850	960	1,140	1,310	
Wage intervals by categories corresponding to specified shares of the median								
0.4-0.6 Med	220-330	260-390	300-440	340-510	390-580	450-680	530-790	
0.6-0.8 "	330-440	390-520	440-580	510-680	580-770	680-910	790-1,050	
0.8-1.0 "	440-550	520-650	580-720	680-850	770-960	910-1,140	1,050-1,310	
1.0-1.2 "	550-660	650-780	720-860	850-1,020	960-1,150	1,140-1,370	1,310-1,570	
1.2-1.4 "	660-770	780-910	860-1,000	1,020-1,190	1,150-1,340	1,370-1,600	1,570-1,830	
1.4-1.6 "	770-880	910-1,040	1,000-1,140	1,190-1,350	1,340-1,530	1,600-1,830	1,830-2,090	
1.6-1.8 "	880-990	1,040-1,170	1,140-1,280	1,350-1,530	1,530-1,720	1,830-2,060	2,090-2,350	
Over 1.8 "	Over 990	Over 1,170	Over 1,280	Over 1,530	Over 1,720	Over 2,060	Over 2,350	
	Number of workers (in % of total)							
Total	2	24	26	22	16	8	2	
% of workers in wage intervals corresponding to specified shares of the median								
0.4-0.6 Med	0.1	1.2	1.3	1.1	0.9	0.3	0.1	5
0.6-0.8 "	0.3	4.3	4.7	4.0	2.8	1.6	0.3	18
0.8-1.0 "	0.5	6.3	6.8	5.7	4.1	2.1	0.5	26
1.0-1.2 "	0.4	5.2	5.8	4.8	3.5	1.8	0.5	22
1.2-1.4 "	0.3	2.9	3.1	2.6	1.9	1.0	0.2	12
1.4-1.6 "	0.2	1.9	2.0	1.8	1.3	0.6	0.2	8
1.6-1.8 "	0.1	1.0	1.0	0.9	0.6	0.3	0.1	4
Over 1.8 "	0.1	1.2	1.3	1.1	0.9	0.3	0.1	5
	Distribution of workers by transformed wage intervals							
Up to 500 rubles	0.7	4.7	3.2	1.1	0.4	0.1	—	10.2
500- 600 "	0.5	4.6	3.7	2.1	0.8	0.1	—	11.8
600- 700 "	0.3	4.4	4.8	2.6	1.5	0.2	—	13.8
700- 800 "	0.2	3.7	4.3	3.3	1.7	0.6	0.1	13.9
800- 900 "	0.1	2.3	3.4	3.1	2.4	0.8	0.1	12.2
900-1,000 "	0.1	1.5	2.2	2.8	1.7	0.9	0.2	9.4
1,000-1,200 "	0.1	1.6	2.5	3.3	3.2	1.7	0.3	12.7
1,200-1,400 "	—	1.2	1.6	1.9	1.8	1.4	0.5	8.4
1,400-1,600 "	—	—	0.3	1.1	1.3	1.0	0.3	4.0
1,600 and over	—	—	—	0.7	1.2	1.2	0.5	3.6

ferrous metallurgy and the timber industry to 25% in the woodworking and fishing industries. Following this, the coefficient of variation before and after the wage adjustments is determined for separate branches and enterprises where wage adjustments have been carried out. In branches where the setting of quotas was neglected and in sectors in which there were great differences in the average percentage of quota fulfillment, the coefficient of variation is reduced by 5 to 19% when introducing new wage provisions, and in other branches by 3 to 5%.

With these data as a starting point we evaluate the coefficients of variation of the quotas in drafting new wage provisions. Then, knowing the remaining percentage of quota fulfillment, we find the distribution of workers according to quota fulfillment: up to 100%, from 100 to 120%, and so on. In order to finally establish the projected distribution of piece workers according to quota fulfillment we must assign to this distribution some skewness to the right, reducing somewhat the number of workers who are not fulfilling their quotas as compared to a normal distribution. A greater skewness should be assumed in the distribution in the case of workers earmarked for premiums for fulfilling quotas or when payment is made at progressive piece rates. (3)

If the work underway concerns not one but all branches it is advisable to group the branches on the basis of the coefficient of variation of output quotas: up to 15% — branches with continuous and homogeneous production processes (blast furnaces, open-hearth furnaces and rolling shops, basic chemistry, basic production in oil refining, etc.) as well as branches with a large share of machine time in the quota (textile industry and the like); 15% to 20% — branches where hand and mechanized labor are combined on a large scale (machine building, the rubber industry, a number of food branches, etc.) and branches with varying types of production where the remaining percentage of quota fulfillment will differ; over 20% — branches where hand labor prevails (fish processing and so on).

If the task is to calculate the distribution of workers by the amount of wages for a number of years ahead (for 1965, for example) the main difficulty is to take into account the changes in skills and in the regional and industrial distribution of labor, that is, to determine the number of workers by categories, industries and groups of areas over a long period. Such calculations can be made on the basis of past tendencies, with due account for plans for mechanization of labor, production, etc. After calculating the projected number of workers according to wage-scale categories, industries and areas, the distribution of workers by the amount of wages is determined according to the aforementioned methods.

Long-term calculations of the distribution of workers and employees by the amount of wages is a job requiring a great deal of effort. When the initial data (basic wage rates for the first category, wage scales, coefficients of variation of output quotas, differentiation of bonus payments, distribution of workers according to wage-scale categories, forms of payment and types of work, regional coefficients) are relatively few, tremendous calculations which include thousands upon thousands of operations are required.

The experience of calculations of this type carried out in the Combined Economic Department of the Committee on Labor in connection with evaluating the efficacy of the new wage regulations and the provisions for raising the material well-being of the people showed that the job entails a great deal of time. To save time, it is necessary to calculate on a large scale (for example, for industry as a whole without distinguishing individual branches) and to disregard a number of factors, which reduces the accuracy of these calculations.

Therefore, it is essential that we make use of computing machines for these calculations. This is already being done in an experimental way. A detailed elaboration of methods of calculating the projected distribution of workers by the amount of wages with the help of rapidly operating computing machines will improve the quality of the calculation of the wage changes of given groups of workers and employees in the course of raising minimum wages to 500-600 rubles a month and increasing somewhat the wage rates and salaries of the medium-paid workers in 1963-1965.

The main factor in calculating the projected changes in the distribution of workers by the amount of wage is a knowledge of the laws governing this distribution, a knowledge of the factors involved in wage differentiation. However, without possessing the technique of statistical calculations there is little hope of obtaining accurate results. Therefore, besides a knowledge of the substance of the matter, it is also essential to be able to apply statistical methods of calculation.

Footnotes

(1) The structural indexes of wage differentiation are described in the article by A. Karapetian, "Statistical Description of Wage Distributions" in the collection Voprosy Truda, Issue No. 1, Profizdat, 1958.

(CONTINUED ON PAGE 44)

LABOR PRODUCTIVITY AND THE THEORY OF VALUE

Voprosy Ekonomiki, No. 5, 1960

S. STRUMILIN:

Social Productivity of Labor and Methods of Measuring It

The "law of the increasing productive power of labor" is a most important one in political economy. In disclosing its substance, Marx defined it as a law, "according to which the costs of production are constantly falling, while living labor continues to grow more productive." (1) He called it a general universal economic law. Consequently, this law operates in all the stages of the evolution of social production. However, under capitalism it manifests itself merely as a tendency that is constantly being violated, and therefore it does not possess unqualified significance. Moreover, when capitalism grows decrepit and more and more moribund, it contradicts the requirements of this law and even, as Engels noted, "interferes with the growth of productivity." (2) However, for us this law becomes all the more important in the conditions of socialism's economic competition with capitalism. In a socialist economy its continuous operation and balanced application are decisive for success. "The productivity of labor," Lenin wrote in 1919, "is, in the final analysis, the most important and prime factor in the victory of the new social system." (3)

The steady growth of labor productivity and the accompanying continuous reduction in the special costs of production are, in point of fact, two sides of the same process, a process in which the most general principle of time saving is realized. This principle may be viewed as the point of departure for the whole science of economics for, as Marx wrote, "any kind of economy is ultimately reduced to time saving," (4) and this applies to total costs of production and to expenditures of living labor. Elsewhere he notes: "A real economy — saving — consists in the saving of labor time; [a minimum (and the reduction to the minimum) of the costs of production]; this saving is equivalent to the growth of productive power." (5) "Consequently the saving of time, just as the balanced distribution of labor time among the different branches of production, remains the first economic law based on collective production. This becomes a law to an even greater degree." (6) In another connection Marx wrote: "Labor time always remains — even when exchange value has disappeared — the creative substance of wealth and the yardstick for gauging the costs required for its production." (7)

From these citations from the Marxist classics it is clear that both the principle of time saving and the universal law of the rising productive power of labor, which is equivalent to this principle, not only retain their significance but even become more important under socialism and communism. In particular, Engels asserted in his polemic against Dühring that the freeing of the means of production from the shackles of capitalism "is the sole prerequisite for the steady and constantly accelerating development of the productive forces, and thus for the practically unlimited growth of production itself." (8) The entire present-day wealth of experience that the socialist countries have accumulated corroborates in practice Engels' brilliant theoretical prediction. The rate of increase in the productive power of labor in these countries is several times higher than in the capitalist countries.

How do we determine and measure this growth, both in theory and in daily practice?

"When we speak of increasing the productive power of labor," Marx wrote, "we mean any change in the labor process whereby the labor time socially necessary for the production of a commodity is reduced, so that a larger amount of use value is produced by less labor." (9) However, the socially necessary time determines the value of the commodity and hence everything that reduces this value enhances the productive power of labor. "When the productive power of labor rises it produces the same use value in a shorter period of time. Conversely, when the productive power of labor is reduced more time is required to produce the same use value." (10) Marx usually uses the concept of "the productivity of labor" in the same sense as the idea of the "yield of labor" or the "efficacy of labor power." "The same change in productive power which increases the yield of labor and therefore

This article is intended to pose the question.

ncreases the amount of use values it generates, iminishes the magnitude of the value of this in-reased total mass because it lessens the sum total f the labor time required for its production. The onverse is equally true." (11) At the same time, n all cases when he speaks of abstract labor of verage quality creating value Marx uses the idea f the "productive power of labor," and the "produc-ivity of labor" as synonyms.

Proceeding from his definitions of the productive ower of labor, Marx concludes: "Thus, the magni-ude of value of a commodity varies directly as the mount, and inversely as the productive power of ne labor embodied in it." (12) We also know that alue is determined by the average amount of so-ially necessary time, or in other words, that "the mount of labor alone, regardless of its quality, is ne measure of value." (13) But if the labor ex-ended to produce a concrete commodity is of a igher skill or intensity than average labor, this complex" labor is regarded as simple labor multi-lied and is reduced to average labor through mul-iplication by an index of its quality, or the so-alled coefficient of reduction. Furthermore, one nust remember that the value of a commodity is etermined by the sum total of expenditures of both .ving and past labor embodied in it. Taking all nese factors into consideration and designating the roductive power of labor by P_S, the labor value of ne product by w, its use value in natural form by ', the past and living labor in units of time as $= t_1 + t_2$ and the quality of labor by k, we arrive t the following formula to express their interrela-ions:

$$P_S = 1:w = p:kt = p:k\,(t_1 + t_2)$$

These equalities show that there are two ways in hich we can measure the productive power of la-or: either by taking a value inverse to the labor alue of a commodity, or by taking the proportion f the entire use value to the labor value — which mounts to the same thing and which is the propor-on of the entire use value to the sum total of the verage or so-called "reduced," or averaged labor mbodied in the commodity. But when the level of roductive power is compared over different peri-ds of time for a large number of enterprises em-loying many workers, or for the whole of the na-onal economy in general, the quality of labor is nen fully reduced, with the reduction coefficient eing omitted from the formula since it is now ex-ressed as 1. Now our formula will be simpler, to it:

$$P_S = 1:w = p:t = p:(t_1 + t_2).$$

In this case the "productive power" and "productivity" of social labor are measured by one and the same value. These concepts here are completely identical. At this point we should note the following singularity which, as the productivity of labor changes, manifests itself in the changing structure of past and living labor in the value of the commodity. "The value of a commodity," Engels wrote, "is determined by the entire labor time, both past and living, that is embodied in it. Rising productivity of labor means precisely a decreasing share of living labor and an increasing share of past labor. However, the latter increases in such a fashion that the sum total of the labor embodied in the commodity is reduced." Furthermore, "that part of the value which comes from the raw and auxiliary materials should diminish when the productivity of labor rises. Conversely, the most characteristic feature of the rising productive power of labor is the fact that the basic part of constant capital expands markedly and, together with it, there is an increase in that part of its value which is transmitted to the commodity as a result of wear and tear." However, all these "increases in value must be more than offset by the diminution in value stemming from a reduction in living labor. For this reason it would seem that such a decline in the sum total of the labor embodied in the commodity should serve as an essential sign of a rise in the productive power of labor, whatever the social conditions of production. This would unquestionably be used to measure the productivity of labor in a society in which the producers will regulate their production according to a predetermined plan, and even in conditions of simple commodity production." (14)

Unfortunately, Soviet statistical practices have yet to justify Engels' prediction. So far only the productivity of living labor has been taken into account. We may find some justification for this in the difficulty that besets us when we want to determine, in its natural form, the expenditure of "past" labor t in the formula $P = \frac{p}{t_1 + t_2}$. Incidentally, some statisticians even tried to question the usefulness of this formula for measuring labor productivity from a theoretical standpoint. Thus, in a discussion on labor productivity one speaker made the following objection to justify Central Statistical Administration practices running counter to Engels' conception as quoted above. "Economically, only living labor is productive," he said. It is likely that in this case he meant Marx's formula according to which "living labor constantly grows more productive" as the total costs of production diminish, or the formula according to which value is created only by living labor. However, neither

formulation can serve to justify a practice which completely ignores Engels' theoretically fully substantiated definition of the productivity of labor.

Living labor can, of course, be more or less productive. But is it only the quality of living labor that determines its total productivity? Is not the equipment of living labor with machinery, that is, precisely with embodied labor, decisive for increasing the productive power of labor? Whence this word "only"? "The specific development of the social productive power of labor in each separate sphere of production," Marx wrote, "varies in degree; it may be higher or lower depending on how great is the amount of the means of production set into operation by a definite quantity of labor, or — with a given working day — by a definite number of workers." (15) This means that the degree to which living labor is equipped with the means of production, that is, with the products of past labor, may serve as a gauge of the development of the productive power of labor. From this we can clearly see how grave is the blunder that practical workers commit when they completely ignore the whole of past labor in considering the productivity of labor. The fallacy of this method is still more manifest when it is necessary to compare the level of the productive power of labor required in the production of goods whose use values are not directly commensurable. We know that "the productive power of labor develops very unevenly in the various industries, moreover, it is uneven not only in the degree of its development but often it even changes in opposite directions." (16) But since the use values of these products are incommensurable we can only judge their changes by examining the proportions of embodied and living labor in the products of the different industries. In such cases he who is satisfied with the reckonong of living labor and nothing more will have nothing at all to go by in comparing the levels of labor productivity in the different industries.

Some practical workers try to find theoretical justifications for the various shortcomings in statistical practices and thus shut the door to their correction. Justifying these practices even when they patently diverge from Engels' definition, they assiduously quote Marx to bolster their own theoretical positions. It goes without saying that value is created only by living labor, whereas past labor merely transmits the value created in a preceding stage to the products of a subsequent stage of production. However, in every preceding stage of production this "past" labor was living labor that participated in the creation of both the use value and labor value of the given final product. If we seek to measure the social productivity of labor in the production of this product according to the formula p:t, where p designates the use value and t the labor value, the sum of the latter must unquestionably include all its formative elements, including not only the living labor taken into account in the final stage of production but also all the elements of labor embodied in commodities in the preceding stage of production.

One would think that Marx's and Engels' interpretation (as given above) of the concepts of productivity of labor and the value of products, as well as their conclusion on the inverse relationship between these values, to be clear enough. But since some of our statisticians still do not understand these ideas properly, it may perhaps be in order to explain them in somewhat greater detail.

Suppose we do not have to take past labor into account at all in measuring labor productivity. Let us try to measure only the productivity of living labor at two factories making the same product. Suppose they produce 1,000 kg. of fabrics per shift. They have the same technical level, etc., their only difference being that one has both spinning and weaving shops while the other has only weaving shops. Suppose, furthermore, that 3.5 man-hours are spent to produce a kilogram of yarn, and that another 5.6 man-hours are required to convert this yarn into fabric. Then the weaving mill that receives the yarn from somewhere else will need only 5.6 hours of living labor to produce one kilogram of fabrics. But at the mills having both spinning and weaving shops the amount of living labor expended will total 9.1 hours (3.5 + 5.6), or 63% more. Thus, if we take into account only the amount of living labor in determining the level of labor productivity at enterprises with different combinations of shops, we would be clearly in error if we concluded that the productivity of labor at one of them was much greater than at the other. This method also leads to similar errors when you have a different degree of cooperation of labor at different enterprises. One enterprise, for instance, may make all parts it needs directly on the spot. A second may assemble the ready-made parts which it receives from a third factory. Naturally, the expenditure of living labor alone per unit of finished product cannot serve in all these cases as a measure of the amount of labor that the product consumes.

However, to plan the productive proportions of labor according to society's requirements we must know the sum total of the labor consumed in the production of goods. It is every bit as important — in order to properly plan the scale of the various stages of production and to properly set output quotas for each part and each operation — to know

long with the total amount of labor required to roduce the goods we need, also the partial or local abor requirements in each sector of production, on ach part and in each operation. In other words, esides the social productivity of labor we must al- o analyze the local productivity of labor for each ndividual enterprise, shop, and even workers. It s only natural that the calculation of the economies n the expenditure of living labor is of decisive im- ortance for these purposes. However, even in hese calculations we would be seriously mistaken vere we to ignore the economies or losses in each ector of production, where material values are lso expended along with living labor, and where onsequently we can have either economies or poilage or a technically unforeseen overexpendi- ure of these values.

The Marxist classics, of course, did not delve nto all the details of this problem. However, they id make a distinction between a concept like "the ocial productive power of labor," which is meas- red by the expenditures of the whole of living and ast labor, and concepts like the shop "productiv- ty of spinning labor" and even the individual "pro- uctivity of the spinner's own labor," which they elated to the number of hours of living labor ex- ended. The concept of labor productivity, whether neasured socially or locally, does not change. Nor oes our formula $P_S = 1:w = p:t$ — which we use to etermine the magnitude of the productivity of a ingle worker or a whole group of workers — hange, either. However, its constituent magni- udes acquire a different significance when we turn rom social production in general to its individual ections.

If our aim is to compute the productivity not of ne total labor embodied in the product in question, ut only of the labor of the workers taking part in ne given stage or sector of its production (weav- rs, for instance), then t will signify only the living abor of the weavers in the compared sections, and e will disregard the labor expended by the spin- ers, cotton-growers and all other workers who ontribute to the production of cotton fabrics. In onsidering this local productivity alone, t will sig- ify not the full value of the fabric produced in ubles, but only that part of it contributed by the eavers, and it will be determined by the amount of neir work, by the expenditure of their labor in onverting yarn into the fabric of the required qual- y.

In connection with these distinctions we must losely examine such concepts as the "social" and local" or individual productivity of labor. Each as its own sphere of application and its own par- cular features in actual practice. Their importance as very significant measures for gauging our achievements in the struggle for communism, in the international competition of economic systems and in the emulation movement at home between the various links of socialist labor — between industries and between districts — is very great and is growing all the time. However, our statistical practices do not always measure up to all the requirements of theory. The theoretical grounds of various indices of labor productivity are also vague on some points and this, naturally, interferes with their extensive application.

***

Labor productivity indices which cover the whole of social production may simultaneously be used to determine the level of the social productive power of labor in the society in question. "The productive power of labor," Marx pointed out, "is determined by various circumstances, among which may be mentioned: the workers' average skill; the development of scientific theory and the degree to which this theory is applicable in practice; the social organization of production; the supply and the efficiency of the means of production, and finally, physical conditions." (17) These factors do not include all those that determine the level of the productive powers of society. However, they take in far more than the narrow boundaries (merely the "implements of production" and the "people" who set them in motion) to which some of our authors limit themselves. For it is a fact that one cannot incorporate in the idea of the "implements of production" such factors, for instance, as electricity or atomic energy, although the equipment of labor with these "means of production" is a prime factor in expanding the productive forces of society. Nor do the "implements of production" take in science, physical working conditions and the social mode of production, all of which unquestionably affect the level of the productive forces. Marx's definition is much fuller and more accurate, as it takes in all the means of production and the producers themselves.

All the more significant, therefore, is the fact that this definition does not include as factors that need to be taken into account such elements as individual differences in skills and in the intensity of labor. This, of course, is not fortuitous. Naturally, such individual differences may increase or decrease the amount of the product obtained within a unit of time and therefore must be taken into account in determining the individual or local productivity of labor in some very limited sections. But the productive power of labor, as the factor characterizing its social efficiency, is measured by the saving in value achieved in the production of the

social product in the period under review, and the value, furthermore, is always determined by labor of average quality regardless of its variation at the individual sectors of social production. In other words, in the concept of the productive power of labor Marx includes only those objective factors of production (its equipment with implements of labor and nature's gifts) which, while making labor more effective and increasing the number of products made in a unit of time, do not — in contrast with the increased intensity and skill of labor — raise its labor value.

This distinction must be taken into consideration when we turn from the determination of the local "productivity" of labor in individual sectors of production to the evaluation of the "productive power" of labor of average quality. Incidentally, as far as this most general concept of "the productive power" of labor is concerned, its level — despite the claim that only living labor is productive — does not depend upon living labor at all. As Marx pointed out, it increases with the increase in the average organic composition of capital, that is, according to the proportion c:v. This growth is "merely another expression of the progressive development of the social productive power of labor which is reflected precisely in the fact that by using more machinery and constant capital in general, but with the same number of workers and the same period of time, i.e., with less labor, more raw materials and accessories are converted into products." (18) When the amount of living labor expended remains constant, its productivity thus becomes a function of past labor only.

Under socialism there is no need to speak of the organic composition of capital. Labor power has ceased to be a commodity and does not possess value. With time the conception of payment for labor will also disappear. But the relation of past labor c to living labor (v + m) in social production — as an indication of the organic composition of its prime elements and as a measure of the equipment of living labor — will retain its importance. It will also retain its role as a general indicator of the growing productive power of labor. However, this ratio of c: (v + m) will be still more important in studying the effectiveness of capital investment in one or another means of labor. But as we know from experience, the effectiveness of investment is not the same throughout. It hinges not only on the quantity but also on the quality of the means of labor, which is by no means always proportional to their value. In some branches technical progress cheapens the means of labor more quickly, in others more slowly. For this reason alone there is no direct proportionality between the equipment of living labor with past labor (in terms of value) and the productivity of labor in all its branches. At the same time there is no question that it is precisely this equipment of living labor with the elements of past labor and the pace of accumulation and investment in the means of labor required for its growth that are the main factors in increasing the social productivity of labor. The interrelations between this factor and its results have still not been studied adequately enough, but they must be studied and Soviet economists have already been set this task.

If one proceeds from the inverse relationship between the value of the product and the productivity of labor, then to study the time and spatial changes in the latter, it is enough in a planned economy to organize merely a systematic assessment of the value of all types of products in rubles and of the labor consumed in all sections in either man-hours or in other units of labor time. Indeed, if in the base year the value w_0 of one ton of coal with a calorific power of 7,000 calories per kg. was equal to 10 rubles while in the year under review w_1 was equal to 8 rubles, this means that the social productivity of labor in the given branch has risen by 1.25 times ($w_0:w_1 = 10:8$), and that the saving of labor e was equal to 2 rubles or 20%, while the increase in productivity in the period under review was equivalent to $e:w_1 = 2:8$ or 25%. If the prices of the products are planned according to their values the same method may also be applied to the entire combined social product. It would be sufficient in this case to appraise the social product of the period under review P in prices of the current period and the period under review in order to obtain the index of the relative increase in the social productivity of labor ($1 = w_0w_1$), the value of the economy derived ($e = w_0-w_1$) in rubles, and the increase in the productivity of labor ($e:w_1 \times 100$) in per cent. When we learn how to reckon the expenditures of past and living labor in any branch of production, in hours, for instance, and for every 1,000 rubles' worth of the social product, we shall be able to express the economy derived in any period not only in rubles but also in hours of average socially necessary time.

The same method of determining the indices of the relative productivity of labor can also be applied when we want to compare it not in time but in space, for instance in making comparisons between the republics and districts within the USSR. In so doing it would be most expedient, of course, to take as the basis for comparison the average level of labor productivity in each separate branch of production and throughout the entire country in general. In this case, by comparing the total labor requirements in hours or the ruble value of any

product for each republic or district with its average nation-wide value, and by taking into consideration the fact that labor productivity is inversely proportional to value, from the comparisons of value we shall easily determine the comparative productivity of labor in its territorial variations. If it is necessary to make such a comparison for the entire aggregate output of each district, the productivity of labor in each such district — expressed as a percentage of its national average — will be expressed by the following elementary formula: $I_p = (w_c : w_p) \times 100$, where w_p represents the evaluation of the entire output of the district or republic in terms of the average social costs of production in each branch of labor within the limits of the given district or republic, and w_c represents the evaluation of the same product in terms of the value of each constituent product calculated in costs of production on a national scale.

Naturally, this presupposes the calculation of the social costs of production not only for each enterprise or group of enterprises but also for the larger areas and the whole of the USSR. The organization of such generalized calculations of value would provide a reliable basis both for planning prices in conformity with the requirements of the law of value and also for solving many other problems of socialist planning. There is no question that the value of the production of identical products in different geographical and production-economic conditions varies greatly. Therefore, it may be more profitable to make some of these products — even with due account for the cost of transportation — in one part of the country and to make other products elsewhere. This must be taken into consideration in planning the division of labor among districts and especially in the geographical distribution of capital investment in the immediate future. With the reorganization of the management of production and the enhancement of the role of local management bodies, the importance of interregional comparisons of indices of the value of output and of the productivity of labor has undoubtedly increased greatly. Moreover, such comparisons would be still more important for the international division of labor and the planning of total commodity exchange within the socialist camp.

The indices showing the comparative amounts of labor consumed in the production of various goods in different regions will also retain their importance during the second phase of communism, when exchange value will disappear -- there being no need for it — in the internal circulation of products within each country or within whole federations of communist countries. When the monetary measure is replaced by a measure of the average expenditure of labor time, only the methods of reckoning this labor consumption will change. However, it will still be necessary to calculate the full amount of labor consumed in the production of goods, including both past and living labor. This labor currency in hours or days of average labor could also be used to calculate mutual services among the communist nations in the international exchange of the products of their labor, until all nations unite to form one world federation. Even then its basic function will still be the task of planning production-labor proportions in conformity with society's established requirements for various kinds of products.

The law of balanced, proportionate development requires that rational proportions be observed in the distribution not only of living labor, but also of all the elements of past labor that this living labor sets into motion. Therefore, in reckoning the labor consumed in the production of all goods it is impossible to limit oneself merely to the measure of living labor alone. In our planning practice this is developing into a serious obstacle to the reckoning of the full amount of labor consumed in the production of goods and to applying the indices of the social productivity of labor.

It is the practice to calculate the expenditures of past labor only in money terms. By adding the payment for labor to the value of material costs we derive what are called the "production costs" or the costs of the enterprise (c + v). Along with this we also consider the whole of living labor in its natural form. However, in our accounting practice we do not consider the full value or the social costs of production (c + v + m) either in monetary or labor form. This is a very important drawback in our accounting practice. For a long time this was justified by some economists, who considered exchange value as a basically unknowable magnitude during the first phase of communism. However, Marxism does not recognize unknowable things in themselves. The idea of unknowable factors in the calculation of value has also long been discredited. Furthermore, if we proceed from Marxist teachings on the fully normal levelling out of "the general rate of surplus value" (m:v) in all branches of labor, it will be very easy to turn from an estimation of production costs to the determination of the full value of any product in money terms. In a planned economy the general rate of accumulation, $m:v = q$, is always known. And if at a given time we can treat it as equal in all branches of material production, we shall then be able to ascertain the value of any product from the formula $w = c + v (1 + q)$, all values of which — with the exception of q — are available from our accounting procedures.

When we know all these elements of value expressed in money terms, it is also not difficult to express them in labor time. One of these elements, namely v + m, as calculated in rubles corresponds to the expenditures of living labor t_2. However, if we also know the formula c: (v + m) in value terms, we can thus derive the equivalent relation of past labor to living labor (t_1:t_2). In this way we can also ascertain the past labor expressed in labor time. According to my calculations, for instance, in 1955 an average of about 132 man-hours of living labor were expended in the entire sphere of material production to produce each 1,000 rubles' worth of net output (in current prices), and for every 100 hours of living labor expended there were 98 hours of past labor. In other words, each hour of living labor produced 7 rubles 57 kopecks of new value and compensated for 7 rubles 42 kopecks of the transferred value of past labor. So we can quite definitely determine all the elements of value of produced goods both in the form of money and labor. We can also construct indices to characterize the social productivity of labor by reckoning the economy derived in the value of the products manufactured.

From the theoretical standpoint this can hardly evoke any objections. However, our accounting practices still do not use this simplest of methods, chiefly on the grounds that under existing price policies the price of products frequently diverges considerably from their value. In this connection the discrepancy between price and value inevitably affects the accuracy with which the costs of production can be calculated. If we were to base ourselves on such apparently inaccurate value data we would not be able to construct sufficiently accurate indices to characterize the social productivity of labor.

At this point I must note the following. First, since we are speaking of social productivity at the level of whole areas, districts and republics, possible discrepancies between prices and values in current accounting practices should balance out. Second, these indices do not yield nor require hair-splitting accuracy. If the current method of reckoning production costs has clear drawbacks from the point of the requirements of the law of value, should we not first remedy them rather than continue to simply ignore the requirements of objective economic laws? This is all the more the case since socialist accounting can undoubtedly satisfy these requirements and hence must satisfy them.

***

In our current practice we use only the index of the productivity of living labor calculated on the basis of the workers' output in kind or in fixed prices per unit of time. Since we deal here with the productivity of only a definite group of workers employed at some particular stage of the manufacture of the products in question, this way of solving the problem is quite legitimate. The index showing the increase in the producitivity of these workers over any period of time when the expenditures of labor t remain constant is determined from the relation p_1:p_2, and in the case of an equal volume of production p — inversely to the labor consumed in the given volume of output, as expressed by t_2:t_1. Again the point of departure in constructing such indices is the inverse relation between value (or labor requirements) and the productivity of labor. Only this interdependence in the various sections of production is naturally limited to the reproduction of only the newly created value — that is, to living labor.

Unfortunately, this limitation is ignored in our accounting practice in all cases when the entire volume of manufactured output in kind or the entire gross product in constant prices, for both the base period and the period under review, are accepted as the measure of the volume of output. True, when the gross product changes in proportion to the net product this use of gross output instead of net output in calculating the indices of the productivity of living labor does not make them any the less accurate. However, in all cases when the relation c: (v + m) changes in the compared volumes of production, the indices of the workers' gross output may be regarded merely as certain approximations to the truth.

Taking into consideration the fact that the index of labor productivity changes directly in proportion to the quantity or volume of output and inversely to the expenditure of labor time, we may also use the following formula to calculate productivity of living labor:

$$I = P_1:P_0 = (p_1:p_0) \times (t_0:t_1) = p_1t_0:p_0t_1,$$

where p_0 and p_1 are units measuring the volume of output in the base period and the period under review, while t_0 and t_1 are the expenditures of living labor in the same periods. The same value of this "index of the variable constituent" can be expressed by the formula:

$$I = (t_0:p_0):(t_1:p_1),$$

where t_0:p_0 is the value of a unit of output in the base period and t_1:p_1 its value in the period under review. Hence the index of productivity rises in inverse proportion to changes in the value of a unit of the given product. From this it is clear that the volumes of output p_0 and p_1 should fully lend

emselves to comparison in the periods being examined and should correspond to the expenditures living labor embodied in them.

How do we achieve such a comparability of products expressed in expenditures of living labor? Here is an illustration. In the construction of uses in which — all other conditions being equal the actual living space in sq.m. may serve as e unit in which to reckon their use values, in one case ordinary bricks serve as the building material and in the other, large prefabricated blocks and panels made elsewhere. In the second case relatively much less living labor will be needed per unit of living space, but the productivity of labor will not be directly proportional to this index. Let us suppose that at two housing sites the costs of production per 1000 sq.m. are composed of the following elements (in thousands of rubles):

Housing site	c	v + m	w	(v + m):w
1	1,500	500	2,000	25 %
2	1,250	250	1,500	16.7%

According to the method usually used, if output in nd remains constant (1000 sq.m.), the expenditures living labor (v + m) have been cut in half. The nclusion is then drawn that labor productivity has ubled. However, the structure of the expendires of past and living labor at the two sites shows at out of the 1,000 sq.m. at the first site only out a quarter of this space (p_1 = 250 sq.m.) can accounted for by living labor, while at the secd site only one sixth (p_2 = 167 sq.m.) can be acunted for by living labor. Consequently, the acal productivity of living labor at the second site terms of one sq.m. rose not by 100% but only by %. ($P = p_2t_1 : p_1t_2 = 167 \times 500 : 250 \times 250 = 133$). et us note that according to the total expenditures + v + m) per 1,000 sq.m. the increase in labor oductivity will also be 33% (2,000:1,500 = 133%). his is achieved by having the compared values of oss output reduced to net output through multiication by its share in the gross output as dermined by the structure of expenditures k = + m):w.

This solution is based on the presumption that e value of gross output in any branch of producn may easily be divided into the elements of exnditure c + v + m. The value of these elements fully equivalent to their utility, which makes ch of these elements mutually commensurable in e manufacture of goods of a given type and also in eir use value. At the same time, by estimating e value of the elements of living labor in the oss output according to its share k in total value we can also separate from the gross output the tire net output, both in terms of its labor value d its use value, or its physical volume in kind. In calculating the indices of the local producity of living labor in separate sections of proction with a sharply changing structure, the errors that arise from the use of indices of gross output instead of net output may reach unacceptable magnitudes. A method which shows a 100% increase instead of a 33% increase, for instance, is hardly of any use.

On the scale of whole branches of production with a more stable structure, the possibility of such grave blunders is ruled out. However, even here we can still have systematically erroneous conclusions in the direction of exaggerating the increase in labor productivity. The point is that the growth of gross output normally exceeds the growth of net output, for according to Marxist theory the rise in labor productivity derives precisely from the fact that the share of living labor decreases while the share of past labor increases, with the sum total of the labor embodied in the product falling. This theoretical conclusion is also corroborated in practice. Thus, according to Central Statistical Administration reports the volume of gross output in the whole of Soviet industry between 1950 and 1955 (in constant prices) rose by 85% while the number of workers increased from 11,308,000 to 14,281,000, or by 27%. (19) By following the Central Statistical Administration's method we get a 46% increase in labor productivity in the space of five years. However, by analyzing the changes in the structure of the gross output of Soviet industry we can see that according to the available data the net output comprised not less than 49.5% of the gross output in 1950 while in 1955 this figure was not more than 44.5%. In other words, in the five years its share in the gross output dropped by 5%. Consequently, if the gross output increased in these years by 185%, the net output rose only by 160%, and the increase in the productivity of living labor, with the number of workers remaining constant, was only 31% instead of 46%. One would think that such a

marked difference in reckoning labor productivity according to gross output and according to net output of the workers should not be disregarded.

Although index computations in general cannot by their very nature guarantee complete accuracy, given the unquestionable possibility of making these calculations more precise, we must first of all review all the methodological principles of our calculating practices in the light of Marxist theory. There are many vulnerable features in our calculations. One, for instance, derives from the deviations of prices from values. However, when we calculate indices on the scale of the whole national economy these deviations become less marked, compensate for each other, and do not noticeably influence the accuracy of the calculations. As for calculating indices on the scale of separate enterprises, these may be corrected wherever necessary provided adequate attention is paid to changes (m + v) in the structure of the costs of production.

It is much harder to appraise the effect that significant time and spatial changes in the variable composition of output have on the index of this output. So far our accounting practices do not even try to take into consideration the errors arising therefrom in the currently calculated indices of labor productivity, although theoretically this problem can be fully solved. To achieve this end, when there are any changes in the composition of the social product it is quite enough to determine merely the full economies in the social costs of production in all branches of labor. There can be no economy, of course, as regards articles taken out of production or the production of goods which has just begun. As for the rest, in our accounting practice we already reckon the reduction in "production costs" with an accuracy to the nearest ruble. In particular, in the first nine months of 1958 it comprised for the whole of Soviet industry (according to Central Statistical Administration preliminary estimates) about 3% in comparison with the results for the preceding year. Production costs are computed here in percentage of the entire commodity output being compared. Consequently, with respect to the net product we should roughly double this percentage of economy and, furthermore, by considering the surplus product we should multiply it by the percentage corresponding to the average rate of accumulation (m:v). Then the whole of this economy expressed as a percentage of the net product e:(v + m) would serve as a measure of the increase achieved in the productivity of living labor, regardless of any changes in the composition of the volumes of output being compared. In comparing this index with other indices of the variable composition, it could also be used to check both their relative accuracy and usefulness.

The advantage of this index, derived according to the formula $\Delta P = e (v + m)$, is first of all that both in the numerator and the denominator of the fraction e:(v + m) the elements of value computed in money form with accounting accuracy are fully comparable. By completely excluding from the calculation all the costs of past labor we can derive a more accurate index in two respects. As we know, the deviation of prices from values in the evaluation of the products of past labor sometimes reaches very significant dimensions. But by excluding from the gross product all those elements of value that can be estimated with the least accuracy we also avoid all the related mistakes in the computation of the index. At the same time, by subtracting all these material costs of production from the value of the product, we can take into account in our index not only the full economy derived from the increased productivity of living labor but also that share of it achieved by economizing on elements of past labor in the given branch of production.

The value of the compared products in territorial indices valued in identical current prices may also serve as a measure of the "physical" volume of this output. In indices that measure the changes in production over time, this is expressed in constant prices. Then, by comparing such "volumes" of gross or net output with the expenditures of labor in labor time we can also measure the changes in the productivity of labor by the formula P = p:t. However, the denominator of this index t as a measure of labor and its numerator as a measure of the volume of output are interpreted differently in our accounting practice. To choose the best interpretation a theoretical analysis and a comparative assessment of the possible variants is required.

Expenditures of labor can be measured in man-hours, days, months and years of labor time. In practice we usually regard the labor force contingent as including only those workers who take part in actual production, disregarding all the auxiliary and service personnel, apprentices, as well as all office employees and engineering-technical personnel. However, there is nothing to substantiate this practice. In reckoning the number of workers in the USSR, the average number of personnel on the roster is taken into consideration. In the USA the personnel appearing for work are taken into consideration. The question of whether we should take into consideration all the paid labor time, including stoppages, or only the time in which labor is actually performed, is being discussed. Sometimes we also have the problem of reducing complex labor to simple labor in our accounting of employed

ıbor power. Naturally, the correct solution of ıese problems depends on the way in which they re posed. Thus, to set standards of labor con-umption for various concrete jobs or parts, we ıust have detailed data on labor time in hours and ıinutes and, moreover, data on the time in which ıbor is actually performed. Furthermore, data is eeded for the productive workers of the required kill who directly perform the labor in question. owever, a different approach is required in study-ıg social labor requirements and the productivity f labor for the purpose of the planned distribution f the entire labor force in accordance with the ountry's requirements. We must have a full ac-ounting of the entire personnel employed in the roduction of goods and determine the total social-y necessary costs of production thereby incurred. his task also presupposes a full accounting of the xpenditure of time by this personnel and all osses of time throughout the labor year. Stoppages f production, absenteeism and other failures to ırn up for work, the number of hours of daily work nd the number of holidays must all be taken into ccount in analyzing the conditions of labor and its roductivity. However, since we are interested in ıe progress of people's labor in the real condi-ons of their existence, a full year of work is suf-cient to assess their productivity.

The idea of limiting the assessment of the amount f labor consumed in production to the expenditure f labor by production workers only is patently un-enable. This stems from the general definition ccording to which the value of goods and the mount of labor consumed in production change in ıverse proportion to the productivity of labor. If alue (w = t:p) is determined by the entire amount f labor embodied in the product, not excluding the ıbor of auxiliary personnel and of engineering-echnical personnel, then in the inverse magnitude :t) we cannot have a different composition of the ıbor force in ascertaining the productivity of la-or. If we disregard this we will continue making istakes. Thus, in the example cited earlier re-ırding the growth in the productivity of labor in dustry between 1950 and 1955, the number of pro-ıction workers increased by 27% in the five years, hile all production personnel in industry in-eased in the same period by only 22%. By divid-g the index of the growth of output by the greater these two numbers the Central Statistical Ad-inistration unquestionably understated the growth labor productivity by a few per cent.

Taking into consideration the future development various groups of the working class on the way communism, one may foresee even more serious mplications connected with the above factor. The growth of automation may result in the more distant future in the replacement of production workers by engineering-technical personnel, whom our statisticians exclude in general from their computations of the indices of labor productivity. Is it sensible, in such an important matter, to base our index methods on a disappearing foundation? After all, in the final analysis it is labor productivity that is the paramount condition for winning the competition with capitalism.

In view of the tendencies of our social development it is worthwhile dwelling further on the question of the so-called reduction of complex labor to simple labor. This problem is still agitating some economists. There is no question that with the advance of automation labor will increase in complexity. But at the same time not only the contrasts but even the essential distinctions between mental and manual labor will disappear. Our society expects every one of its members to make his contribution according to his ability. But it does not provide for any discounts because of someone's inability or any bonuses for brilliance in the distribution of products under communism.

In our country labor power has long since ceased to be a commodity. There is already a tendency for the levelling out of wages. Later on, the necessity for wage payments will disappear in general. In the conditions of communism there will be no need to reduce complex labor to simple labor, which, for that matter, would be impossible. However, even now, under the conditions of socialism, talk about the need for reduction is merely a hangover of the past. It is not finding any application in our practice and, in any case, we cannot recommend any reduction of complex labor to simple labor in computing the individual or local productivity of labor. This would run counter to all the requirements of the socialist competition movement in which each group of workers seeks to attain the best results in production in the interests of the entire country. One need only reduce complex labor to average or simple labor by putting an equal sign, for instance, between the work of every competent employee and the work of two incompetents, or between the work of every shock-worker and the work of three shirkers, for the productivity of labor of all groups of workers to even out at once in defiance of the iron logic of hard facts. This reduction would probably be quite a consolation for all shirkers, but it would take the very heart out of the idea of the socialist competition movement. And the socialist competition movement is the highway to communism.

***

Footnotes

(1) Marx and Engels Archives, Vol. IV, p. 43.
(2) Karl Marx, Capital, Vol. III, 1954, p. 273. [This and the following citations from the writings of Marx, Engels and Lenin are from the Russian editions of their work — editor.]
(3) V. I. Lenin, Collected Works, Vol. XXIX, p. 394.
(4) Marx and Engels Archives, Vol. IV, p. 119.
(5) Bolshevik, 1939, Nos. 11-12, p. 64.
(6) Marx and Engels Archives, Vol. IV, p. 119.
(7) Karl Marx, Theories of Surplus Value, Vol. III, Partizdat, 1936, p. 198.
(8) Friedrich Engels, Anti-Dühring, Gospolitizdat, 1957, p. 266.
(9) Karl Marx, Capital, Vol. I, 1954, pp. 320-32
(10) Karl Marx and Friedrich Engels, Collected Works, Vol. XIII, 2nd Edition, p. 24.
(11) Karl Marx, Capital, Vol. I, p. 53.
(12) Ibid., p. 47.
(13) Karl Marx and Friedrich Engels, Collected Works, Vol. IV, 2nd edition, p. 89.
(14) Karl Marx, Capital, Vol. III, pp. 271-272.
(15) Ibid., p. 270.
(16) Ibid., p. 270.
(17) Ibid., Vol. I, p. 46.
(18) Ibid., Vol. III, p. 220.
(19) See Narodnoe khoziaistvo SSSR v 1956 godu, Statistical Yearbook, Gosstatizdat, 1957, pp. 36, 50.

***

A. AGANBEGIAN (CONTINUED FROM PAGE 33)

(2) This assumption is quite realistic. The available grouping of data on the distribution of workers in each category by the magnitude of wages in the machine-building industry in October 1934 shows that the coefficient of variation of wages in the categories was approximately the same.
(3) See B. S. Iastremskii, "Distribution of Workers According to Fulfillment of Quotas," Uchenye zapiski po statistiki, Vol. I, Moscow, 1955.

***

Voprosy Ekonomiki, No. 3, 1960

B. MIROSHNICHENKO:

Coordination of the National Economic Plans of the Socialist Countries

The greatest advantage of the socialist economic system is its planned character of economic development. This has been brilliantly confirmed by the USSR's record of more than 40 years of building socialism and communism and by the experience which the People's Democracies have gained in socialist construction.

With the establishment of public ownership of the means of production the law of competition and anarchy of production inherent in the capitalist system loses its force and the law of planned, proportional development of the national economy begins to operate. As a result of planned national economic development the socialist countries are spared the colossal expenditures of social labor which are inherent in the capitalist economy. They have ensured the economical and effective utilization of all their resources. The drawing up of long-term plans is a most important task for the Party, government and economic bodies of every socialist country. The great economic and political tasks can be solved only on the basis of plans drawn up for a number of years ahead. V. I. Lenin taught that it is impossible to work without a plan for several years ahead. When in 1920 the Soviet Union commenced to draw up the world's first long-term state plan for the electrification of Russia, Lenin said that "it is necessary to inspire the masses of workers and politically-conscious peasants with a great 10-20 year program." (1) Many years of experience gained by the USSR in building socialism and communism vividly demonstrate how exceptionally important long-term plans are for the successful economic development of the Soviet country, for raising the cultural level and improving the well-being of the Soviet people.

With the establishment of the world socialist system the advantages of the planned economy have increased even more on the basis of the extension and consolidation of economic cooperation among the socialist countries.

In the first years after the victory of the people's democratic revolutions the economic development plans in the People's Democracies were drawn up for short periods, chiefly for one or two years. Main attention in these plans was paid to the most rapid rehabilitation of the economy destroyed by war. Simultaneously with the rehabilitation of their national economies the People's Democracies extended the position of the socialist sector in their economies. The share of the capitalist sector in industry was still considerable at the time because the nationalization of the large and medium industries was carried out in most of the People's Democracies not at once but in several stages. The capitalist sector occupied a particularly big place in internal trade, not to speak of agriculture. The multi-form character of the economy limited the sphere of operation of the law of planned proportional development of the national economy in these countries. Yet towards the end of the rehabilitation period the share of the socialist sector increased considerably, particularly in industry and trade. As a result of this the sphere of operation of the economic laws of socialism, including the law of planned, proportional development, has been considerably extended.

The consolidation of the socialist sector of the national economy enabled these countries to introduce planning on a much wider scale in all branches of the economy. The solution of the new tasks in the sphere of socialist construction made it necessary to draw up plans not for one or two years, but for much longer periods. Using the rich experience of the Soviet Union, the People's Democracies have begun to draw up and implement long-term plans of national economic development. These long-term plans play the leading role in planning practice.

In the course of implementing the first long-term plans of national economic development the People's Democracies have made considerable

headway in industrialization. As a result of socialist industrialization, formerly backward, agrarian countries like Poland, Hungary, Rumania and Bulgaria have become industrial and agrarian countries with a well-developed heavy industry. Czechoslovakia and the German Democratic Republic have reconstructed the framework of their industries inherited from capitalism and have made great progress in their further development. The development of industry in the People's Republic of China and in other socialist countries of Asia is also proceeding at high rates.

According to preliminary estimates the volume of industrial production of all the socialist countries in 1959 exceeded the prewar level by more than 5 times, while the industrial output of the capitalist countries only doubled. Even more striking are the data on the rates of industrial development in individual socialist countries. Gross industrial output in the USSR in 1959 was approximately 40 times greater than in 1913. Compared with 1958 the increase in industrial production in the USSR in 1959 was more than 11%, in the People's Republic of China — 39.3%, Poland — 8.8%, Czechoslovakia — 10.9%, the GDR — 12%, Hungary — 12%, Rumania — 11.1%, Bulgaria — 25%, and in the Korean People's Democratic Republic — 53%.

Developing their socialist economy, some People's Democracies have already surpassed the economically developed capitalist countries of Western Europe in the per capita production of the most important items of heavy industry. In the per capita production of pig iron and steel Czechoslovakia, for example, occupies one of the leading places in the world. Poland has considerably surpassed Italy in the per capita production of a number of industrial items and in the next few years it will approach the level of France. The GDR is surpassing Western Germany in the per capita production of many important types of products.

The People's Democracies have also achieved great successes in the development of agriculture. Providing tremendous material assistance to agriculture by supplying it with machinery, equipment, mineral fertilizers, etc. and extending every possible support to the agricultural production cooperatives that are developing on a strictly voluntary basis, the People's Democracies are ensuring a rise in agricultural production and an improvement in the welfare of the peasants. The volume of agricultural production in all the People's Democracies at present has surpassed the prewar level. This enables them to satisfy more fully the requirements of industry in agricultural raw materials and those of the population in food.

***

Close cooperation is the basis for the successfu economic development of all socialist countries. The most important features of cooperation among the socialist countries are, first, that it is develop ing in a planned way, and second, that the interests of every socialist country are taken into strict con sideration, which means that this cooperation is of mutual benefit for them. This is not all, of course for the most essential element in the relations among the socialist countries is mutual assistance and primarily the economic assistance rendered b the most developed countries to those that were economically backward in the past.

The planned nature of the economic cooperation of the socialist countries does not at all mean that the economy of every socialist country is develop ing in accordance with a plan drawn up for all countries of the socialist camp as a whole, and that, consequently, a socialist country receives in structions from outside as to the rate at which it should develop its economy, in what quantities it should manufacture certain types of industrial pro ucts, and in what proportions it should distribute its national income for purposes of accumulation and consumption, etc. This, indeed, is not so. Every socialist country is a sovereign, independen state and it develops its economy guided by its ow interests, possibilities, etc. Yet at the same time the common ideology and common aim -- the building of communism -- predetermine a single trend of economic policy and the character of economic develop ment for all socialist countries. This also predeter mines their mutual relations: every socialist countr considers it to be its international duty to help the oth socialist countries and closely cooperate with them.

Although the development of the world socialist economic system is not planned from one planning center and the socialist countries do not have a single long-term economic plan, their close cooperation with each other has made it necessary t coordinate their national economic plans. Such co ordination of their national economic development plans means linking up and mutually adjusting the development of the major branches of their economy on the basis of equality and complete voluntariness on the part of the participants, so as to e sure high rates of growth of production in the socialist camp as a whole, and in every socialist country separately. The coordination of the national economic plans of the socialist countries enables every country to plan the most rational utilization of its natural resources, production capacities and manpower reserves, the most rationa

se of capital investments, to take better account of he concrete conditions of their economic develop- nent and the requirements of the fraternal coun- ries, to ensure greater mass output of manufac- ured goods, raise the technical level and reduce he costs of production.

The coordination of national economic plans is a ew and higher stage of economic cooperation mong the socialist countries. Comrade N. S. Khru- hchev pointed out in his report to the 21st Con- ress of the CPSU: "Coordination of the national conomic plans is the form in which the productive fforts of the socialist countries are pooled in the urrent stage." Such coordination is capable of en- uring in the most complete way a planned and ef- ective economic cooperation of the socialist coun- ries in all its forms.

The planned nature of the economic cooperation f the socialist countries means that in drawing up s national economic development plans every ountry has the possibility not only of determining n advance the internal resources it will have at its isposal in the planned period of development but lso of taking into account the advantages of the in- ernational socialist division of labor. This is par- icularly important because it permits much higher ates of economic development to be achieved com- ared with those which would have been possible if ach country relied only on its own resources. The nternational socialist division of labor makes it ossible to combine correctly the national interests f the peoples building socialism and communism ith the interests of the entire world socialist sys- em.

In drawing up its national economic plan a so- ialist country proceeds on the basis of agreements has concluded with other socialist countries that pro- ide for firmly guaranteed outside sources of re- ources which it lacks. No fluctuations in the orld market can cause a violation of these agree- ents as regards deliveries or the terms of de- veries, as happens in the relations among capital- st countries. Planned cooperation enables every ocialist country to determine its volume of pro- uction for several years ahead, including the out- ut of those items which are produced in quantities bove its internal requirements.

In his report to the 21st Congress of the CPSU omrade N. S. Khrushchev vividly and convincingly owed how important the planned international so- ialist division of labor is for each country and for e socialist camp as a whole:

"By itself no country could develop at the rapid ace at which it develops within the system of so- ialist countries. The distinctive feature of the conomic development of the socialist countries is that their interrelations are consolidated as they go forward, and the world socialist system is thus further cemented ... The growth and development of each socialist country tends to reinforce the entire socialist system. Herein lies our strength and the guarantee of the imminent victories in socialism's peaceful competition with capitalism."

Like the Soviet Union, in drawing up their long-term plans the People's Democracies proceed from the fact that the purpose of socialist production is the maximum possible satisfaction under existing objective conditions of the constantly rising requirements of the whole of society. The realization of this aim demands continuous economic development at a high rate on the basis of the constant technical improvement of production. It is objectively necessary, therefore, to ensure the priority development of the production of the means of production, i.e., priority development of heavy industry, capable of satisfying the requirements of the national economy in machines, equipment, fuel, electric power, etc.

Great amounts of resources are necessary for the solution of the task of establishing a modern heavy industry in a short period of time. Even large states cannot easily find such means, not to speak of small and medium-sized states. Yet because of the existence of the world socialist system, and with the help of such a mighty socialist country as the Soviet Union, this task is being successfully implemented by the People's Democracies. As a result of the continuously developing international socialist division of labor there is no need for every country to establish all branches of heavy industry within its borders. Development of all branches of heavy industry would be economically inexpedient and impossible for most of the People's Democracies. Things are quite different as regards the Soviet Union and the People's Republic of China. They occupy huge territories, have numerous manpower reserves at their disposal, and possess great natural resources. Therefore it is possible for them to develop an integrated industrial complex and at the same time actively participate in the international socialist division of labor.

Industry is developing in the People's Democracies with due account for the specific features of each country, its natural conditions, the economic expediency of establishing one or another industry, on the basis of extensive specialization and cooperation among all the socialist countries. This enables every country to utilize its material, labor and financial resources in the most rational way and not to disperse them on numerous projects. As a result, the People's Democracies are able to

ensure high rates of development of their industries, particularly heavy industry.

In accordance with the law of planned, proportional development operating within the entire world socialist system, the division of labor within the socialist camp is developing not spontaneously but according to plan. As we know, the initial form of economic cooperation among the socialist countries was bilateral short-term trade agreements between the USSR and other socialist countries. These agreements provided for mutual deliveries of goods and for assistance in the rehabilitation and development of the national economy. With the completion of economic rehabilitation there appeared new forms of economic cooperation among the socialist countries. It has become necessary to organize the kind of cooperation that would ensure the planned development of the international division of labor within the socialist camp for the purpose of utilizing in the most rational way the economic potential of each individual country and of the socialist camp as a whole. Already in the very first stage of development of economic cooperation among the socialist countries, a Council for Economic Mutual Assistance was established in 1949 to pool the efforts of the socialist countries in solving the tasks of economic development of each country and of the socialist camp as a whole. Since its establishment the Council has done a great deal to organize the planned development of economic cooperation among the socialist countries. Particularly important was the Council's work in coordinating the long-term national economic plans of the socialist countries, a job which it has carried out in the past few years. Such coordination of the national economic plans has become a most important task of the Council. This work is conducted on a large scale at present, since most of the People's Democracies have completed their first long-term plans of economic development.

When the socialist countries began to draw up their new long-term plans (most of them for 1956-1960) they already had considerable production capacities at their disposal in industry. It became necessary to coordinate to the maximum the long-term plan of each country with the plans of other countries in order to ensure, first, fuller use of these production capacities, and second, to prevent parallelism in the development of similar types of production. Such parallelism frequently occurred during the implementation of the first long-term economic development plans in the People's Democracies, when economic cooperation among the socialist countries was carried out basically in the form of mutual deliveries of certain types of raw and other materials, fuel, foodstuffs and equipment, while coordination of the national economic plans was not yet developed. As a result some People's Democracies established industrial enterprises that manufactured similar types of products (this was especially evident in the machine-building industry) in quantities that were in excess of the internal requirements of the country and without regard for the possibility of exporting the products to other socialist countries. These enterprises did not work at full capacity and their finished products were expensive. Some industrial enterprises were built without taking account of fuel and raw material resources. This hindered the implementation of the economic development plants, capital investments were dispersed, considerable funds were allocated for the development of industries less promising for the given country, to the detriment of more promising industries. Extremely strained rates of development of some industries and the inability, in such conditions, to invest sufficient funds in agriculture caused partial disproportions in the national economy. Capital investments were dispersed over too many projects, thus slowing down their commissioning. Such drawbacks were exposed and overcome in each country under the leadership of the Communist and Workers' Parties of these countries. Yet many of these drawbacks could be fully eliminated only through coordination of the economic development plans of the individual socialist countries. Such coordination has become vitally necessary.

In drawing up the new coordinated long-term plans it was important to provide for the elimination of the existing disproportions in the economic development of the individual People's Democracies by further extending the international socialist division of labor, distributing the capital investments among various branches of the national economy in a more rational way and ensuring a further acceleration of the rates of economic development of the entire world socialist system. Particular attention was and is being paid to the planned development of specialization and cooperation of production in the socialist camp, for they make it possible to attain the necessary coordination in the development of the major branches of the national economy of the socialist countries. The solution of this task is possible only on the basis of a consistent policy of coordinating the long-term national economic plans of the socialist countries.

Important problems of coordinating the development of interconnected branches of the national economy of the member countries of the Council for Economic Mutual Assistance were widely discussed at the Council's sessions and at the meetings of its standing committees. They included

oblems of coordinating the development of such in-
stries as machine building, instrument-making,
rrous and non-ferrous metallurgy, coal and oil, etc.
The Berlin session of the Council for Economic Mu-
al Assistance held in May, 1956 determined the line
be taken in coordinating plans and established a
mber of branch commissions to carry out this work.
ie work of coordinating the long-term plans for 1956-
60 carried out after this session was of great im-
rtance for the further extension of the international
vision of labor within the world socialist system and
r a great economic advance of all the socialist coun-
ies. This was noted in particular at the Council's
arsaw session in June, 1957. It adopted a declara-
on which stated that the Council's work of coordi-
ting the national economic plans played an important
rt in the general progress of socialist construction
the Council's member-countries. The work of co-
dinating the national economic plans was continued
the later sessions of the Council. Its 11th session
scussed problems of importance for all the Euro-
an People's Democracies. Among them were the
iority development of the sources of raw materials
r the metallurgical industries, including the increase
the production of coking coal, ferrous and non-
rrous metals, and the improvement of electric pow-
supply.

Of particular importance was the coordination of the
ng-term plans for the development of machine-build-
g, because parallelism in the development of produc-
on in the separate countries occurred most frequent-
in this industry. When plans for the development of
achine-building in 1956-1960 were coordinated, the
vel of production of the major types of machines and
uipment was established. Agreement was also
ached on specialization and cooperation in the pro-
ction of many types of machines and equipment, in-
uding various types of metal-cutting machine tools,
rge and press equipment, products of the electrical,
ricultural and transport machine-building indus-
es, shipbuilding, automobile and tractor industries.
In determining the specialization of production in
e individual socialist countries both their own re-
irements and the requirements of all other social-
countries are taken into consideration. The es-
nce of specialization and cooperation in production
thin the world socialist system lies in the principle
t, with strict observance of equality in the econom-
relations among the socialist countries, irrespective
their economic might, and with strict observance of
e interests of each country, the resources should be
stributed in the most rational way among various
anches of the national economy within each country
d within the world socialist system as a whole, in
der to create conditions for the complete and unin-
rupted satisfaction of the requirements of the
socialist countries for concrete types of products manufactured by each country. Strict specialization of production of individual types of industrial products is economically profitable not only for the producer countries but also for consumer countries, for it makes it possible to increase the volume of output, to apply mass production and production in large series, to reduce the costs of production and raise the technical level of the manufactured products.

The coordination of specialization in the individual industries and types of products does not at all mean that the economy of a country develops depending on the will or wish of other countries, without consideration for its natural conditions, national traditions, experience, etc. On the contrary, these factors play an important role. The GDR, for example, will continue to develop its machine-building and chemical industries. Parallel with the development of machine-building Poland attaches great importance to the development of fuel and chemical industries using her large natural resources. Rumania is developing her oil extracting and oil refining industries, etc.

National economic plans are coordinated in those major industries in which coordination and mutual adjustment are of interest to all socialist countries. This concerns, in the first place, the volume of production in the basic branches of heavy industry: the fuel, iron ore, metallurgical, chemical, power-generating and machine-building industries.

The question of attaining constant proportionality between the raw material and processing industries not only within each country but within the entire world socialist system has acquired great importance in connection with the task of further extending specialization and cooperation of production in the socialist camp.

It is difficult for individual European People's Democracies to fully achieve such proportionality within their own national economies, and for certain types of products it is even impossible.

The GDR, for instance, is unable to satisfy from its own resources the growing need of its machine-building industry for metal. Poland cannot develop her iron and steel industry without importing iron ore from other countries, etc. Yet the world socialist system as a whole has at its disposal huge resources that can be used for further successful development of all branches of the national economy.

The correct distribution of capital investments among individual branches of the economy in each country is ensured on the basis of the agreed coordination of plans for the growth of production in the major industries. In addition, the countries

agree jointly to develop in one country or another such types of production as would be of interest to several of them and extend the necessary loans to the country in question for capital investments. The enterprises constructed jointly by several socialist countries remain the property of the state on whose territory they are situated. The German Democratic Republic and Czechoslovakia, for example, are helping Poland to develop her coal industry. In 1957 they concluded an agreement with Poland under which she received long-term credits for this purpose amounting to 650 million rubles (of which 400 million rubles were given by the GDR and 250 million rubles by Czechoslovakia). Rumania and Hungary have begun to utilize jointly the rich natural gas resources in Rumania. They have also begun jointly to build chemical combines on their territories, etc.

When several countries pool their efforts to build industrial enterprises they can divide their labor in a rational way. As an example we may cite the construction of a cellulose plant in Rumania that will process large reserves of reeds growing in the Danube estuary. This plant is being built jointly by Rumania, Czechoslovakia, Poland and the GDR. The Polish People's Republic is working on the technical problems of production and is responsible for the transportation of goods required by the plant and for the construction of port facilities. The GDR is mainly manufacturing the technological equipment and machines. Czechoslovakia is working on the problem of industrial processing of lye waste to obtain sodium salts and is manufacturing equipment required for this purpose and for power generation. Rumania is carrying out industrial construction.

Plans are coordinated not only in industry but in agriculture, too. Deliveries of vegetables, fruits and grapes from Bulgaria to the USSR, Czechoslovakia and the GDR are taken into consideration when the latter countries draw up their annual and long-term plans. Stressing the exceptional importance of specialization and cooperation in the agricultural production of socialist countries, Comrade N. S. Khrushchev said: "We have to follow the road of close collaboration and cooperation in order to use land in a more rational way in each country, to grow products that can be grown better there considering the existing climatic conditions, and through the mutual exchange of these products to satisfy the requirements of the working people of each socialist country."

At its regular meeting in Sofia in December 1959, the standing commission on economic, scientific and technical cooperation in agriculture of the Council for Economic Mutual Assistance discussed the problem of specialization of certain branches of agriculture in the member countries of the Council. The commission approved the recommendations on the results of the international tests of machines carried out in 1959, and on other questions concerning mechanization and electrification of agriculture, specialization in the production of high-quality seeds and various planting materials, irrigation and drainage of agricultural lands.

At the conference held in Moscow in February 1960 on the exchange of experience in the development of agriculture the representatives of the Communist and Workers' Parties of the European socialist countries discussed a number of problems of the development of agriculture, the possibilities for the fullest utilization of its resources and the prospects for the further advancement of agricultural production in their countries. The participants in the conference agreed that the Council, drawing upon the exchange of views at the conference, should study the possibilities for further specialization in agricultural production, agricultural machine building and the production of chemicals for agriculture, taking account of the interests and potentialities of each country. Cooperation of the socialist countries is being extended therefore not only in industry but in agriculture, too.

At the same time, there is no need for the socialist countries to consider and coordinate their national economic development plans as regards internal trade, cultural institutions, public health facilities, housing construction, public services and other similar spheres. Each country sets itself tasks in these spheres of activity in accord with the level of its economic development, its historic past, national features, and other conditions of the country's development.

The conference of representatives of the Communist and Workers' Parties of the member countries of the Council for Economic Mutual Assistance held in Moscow in May 1958 noted the great importance of coordinating the long-term national economic plans. It also noted that the Council and its standing commissions have done considerable work in preparing recommendations for the drawing up of long-term plans of national economic development of the socialist countries. The representatives of the Communist and Workers' Parties unanimously confirmed the need for the fullest utilization of the great possibilities of the socialist countries and for the full consideration of their mutual interests in drawing up their long-term plans, and also the need for the extension of the mutually beneficial forms of cooperation with a view to raising the level of industrialization of the countries with a less developed industry. The conference worked out and

proved recommendations on further developing onomic cooperation among the socialist countries, operation and specialization in production, as well recommendations for the drawing up of long-rm national economic development plans of the cialist countries.

The 12th session of the Council for Economic utual Assistance held in December 1959 noted the nstantly increasing role played by the Council in ganizing economic cooperation among the mem-r-countries. The session approved recommenda-ns on further specialization in the production of ajor types of chemical equipment and certain pes of machinery and equipment for the sugar, eat-processing and paper industries. It also ap-oved measures for extending cooperation in the n and steel industry, etc. In view of the experi-ce accumulated in the sphere of economic co-eration among the socialist countries and the de-rability of having a charter to replace the earlier cisions defining the aims, principles and organi-tional forms of the Council's activities, the ses-n considered and approved the Charter of the uncil for Economic Mutual Assistance.

The characteristic feature of the coordination of e national economic plans of the socialist coun-es is the principle of complete voluntariness on e part of each country in coordinating its plans th the other countries. At the same time, after rk on coordinating the plans is completed and reed recommendations are adopted, each country ust be sure that these agreed recommendations d mutual obligations will be carried out. With s purpose in mind, on the basis of the recommen-tions adopted by the Council's sessions the coun-es conclude bilateral trade agreements for the riod of operation of the long-term plans. In the urse of their implementation these agreements e reviewed and adjusted at the time when the cur-nt annual plans are being drawn up. The agree-nts play an important part in the implementation the national economic plans of each socialist untry. Of great importance is the strict obser-nce by each country of the obligations assumed garding the terms of delivery of industrial goods d agricultural products, and the observance of all hnical conditions of such deliveries. Violation these obligations by any country hampers the heduled work of the corresponding branches of national economy of another country or even veral countries.

The drafting of the Seven-Year Plan for the na-nal economic development of the USSR for 1959-65 and of the long-term economic development ns of other socialist countries for approximate-the same period was an important stage in further developing and improving the coordination of national economic plans.

The implementation of the Seven-Year Plan of national economic development of the USSR and of the long-term national economic plans of the People's Democracies opens up new prospects for a further expansion of economic cooperation among the socialist states. This will promote the fullest utilization of all the advantages inherent in the world socialist system and accelerate the economic progress of each country.

New long-term plans of national economic development of the socialist countries envisage high rates of economic growth in each country, with the priority development of the production of the means of production, balanced development of all branches of the national economy, a high rate of advance not only in industry but also in agriculture, further rapid technical progress in all branches of the national economy on the basis of the extensive introduction of the latest advanced techniques, high rates of growth of labor productivity as a result of the increase in technical equipment, a more rational distribution of manpower among various branches of the national economy, and a rise in the creative production activity of the working people. The characteristic feature of the new long-term plans, like that of the previous ones, is the provision for a steady growth in the material well-being of the people in each socialist country.

The Seven-Year Plan of national economic development of the Soviet Union for 1959-1965 envisages a growth of industrial production by approximately 80% and of the production of the means of production by 85-88%; the production of electric power will more than double, the output of the machine-building and metal-working industries will approximately double, and the volume of chemical production will approximately triple. Other socialist countries have also planned high rates of growth of industrial production for the same period. Between 1959 and 1965 industrial production in Czechoslovakia and Poland will rise 80%, in the GDR — 88%, and in Hungary — 65-70%. A considerable economic advance will be made by the People's Republic of China. It is successfully solving the task of catching up in the next 10 or 12 years to the British level in the output of the most important industrial products. Under the guidance of the Communist Party the Chinese working people are striving to fulfill this task in less time, in 10 years in the main, and to overfulfill, far ahead of schedule, the basic tasks of the 12-year program of the development of China's agriculture which was planned to be completed in 1967. Great achievements in the economic development of the

People's Republic of China in the past decade, and particularly in the last few years, show that the tasks set by the Communist Party and the Government of China will not only be fulfilled but considerably overfulfilled.

The rapid growth of production in the countries of the world socialist system ensures the successful solution of the task of making the most of the time factor in the peaceful economic competition between the world socialist system and the capitalist system.

The implementation of the tasks set by the Seven-Year Plan of national economic development of the USSR and by the long-term plans of other socialist countries will make it possible to considerably raise the role of the world socialist system in the world economy. As a result of the fulfillment and overfulfillment of the Soviet Seven-Year Plan and the high rates of economic development of the People's Democracies, the countries of the world socialist system will be producing more than half of the world's total industrial output. This will ensure the superiority of the world socialist system over the world capitalist system in material production, the decisive sphere of human endeavor.

Apart from drawing up and coordinating the basic tasks of the long-term plans up to 1965, the socialist countries are paying great attention to the coordination of long-term plans for a much longer period, up to approximately 1975. The possibility of drawing up plans for much longer periods is additional evidence of the great advantages of the planned socialist economy, of the high scientific level of socialist planning based on profound knowledge of Marxist-Leninist theory, of the inviolability of the firm friendship and economic cooperation of the socialist countries.

There is no doubt that in the course of implementing the long-term plans worked out for longer periods the international division of labor within the world socialist system will acquire an even more multi-faceted nature and will permit the closer and deeper coordination of the development of various branches of the national economy in socialist countries.

One of the most important features of the development of the socialist countries within the existing world socialist system is that the countries which lagged behind in their economic development under capitalism are now rapidly catching up with the economically more developed countries, that the general economic and cultural development of all the socialist countries is being levelled out and they are advancing in a single front towards socialism and communism. Of exceptional importance in this respect is the coordination of national economic plans, specialization and cooperation of production in interconnected branches of economy. Comrade N. S. Khrushchev said: "We are advancing shoulder to shoulder, giving each other fraternal assistance and support. In this way we shall gradually raise the economic development of all the socialist countries to a common level." The people of the socialist countries consider it their international duty to help fraternal countries to overcome their economic backwardness. The question of levelling out the development of the socialist countries is of theoretical and practical importance. The possibility of levelling out their economic development has been created as a result of the establishment of the world socialist system. Within it there operate objective economic laws which are distinct from those operating under the capitalist system. Under capitalism the law of uneven economic and political development of different countries operates. The more powerful capitalist countries that have gone far ahead in their development are by no means interested in helping the backward countries to overcome their lag and catch up with the highly developed capitalist countries. On the contrary the powerful capitalist countries are striving in every way to maintain their privileged position in order to keep the backward countries firmly under their yoke. The situation is quite different in the socialist camp.

The levelling out of economic development of the socialist countries is reflected first of all in the much faster rates of growth of production in the formerly backward countries. There are no longer the kind of differences in the economic development of the socialist countries that existed at the beginning of the establishment of the world socialist system. This is confirmed by the following data: the per capita production of electric power in Bulgaria before the second world war was 95.1% less than in Eastern Germany, 85.3% less than in Czechoslovakia, and the production of coal was 94.4% and 85.3% less respectively. In 1958 the output of electric power in Bulgaria was only 80.4% less than in the GDR and 73% less than in Czechoslovakia, and the output of coal was 86.9% and 72.2% less respectively. The gap in the per capita output of the major types of industrial products between other People's Democracies has also sharply diminished.

This situation has become possible because within the world socialist system as a whole there operates the law of planned, proportional development, economic cooperation of the socialist countries is being extended and the international socialist division of labor is deepening.

***

The coordination of national economic plans requires unity of the basic methodological principles drawing up both long-term and current plans. In der to compare the data it is important to estab-sh a single form of the chief indices which are ually coordinated in the national economic plans. ie principal method of drawing up national eco-mic plans is the balance method, which ensures e necessary coordination between the require-ents for the major raw and other materials, fuel, uipment, etc., and the sources from which they e to be met within each country. The exact quan-ies of various types of products which a country n deliver to other countries are determined by aterial balances. The necessary proportions in e economic development of each country and of e entire socialist camp are established with the lp of these balances. It is necessary, therefore, define the nomenclature of the balances which ust be worked out in each country in order to en-re the coordination of the national economic plans the socialist countries. The establishment of a ngle method of working out these balances is also great importance.

The unity of methodological principles in drafting e national economic plans in each socialist coun-y is also highly important in making these plans ell-founded and the tasks set in each country for e planned period feasible. The establishment of acticable targets providing for high rates of owth of the socialist economy is an important task planning. In his report to the 21st CPSU Con-ess, Comrade N. S. Khrushchev said: "The Sev--Year Plan is being drawn up in such a way that can be carried out without undue strain. Why has is been done? Because if we have a very rained plan, there is always the chance that some its targets may not be reached, that some branch- of the economy may not get all they require in e way of raw materials, supplies and equipment, d this is liable to cause interruptions in the rk and, consequently, under-capacity of opera-n of plants and factories, idle working time and the attendant consequences. This is what econ-ists call disproportions. The Seven-Year Plan being drawn up in such a way as to rule this out." This principle of planning is particularly impor-t under conditions of close economic coopera-n among the socialist countries. If some country ould lag behind in the implementation of the plan those products which it is to deliver to other untries on the basis of the coordination of the na-nal economic plans, this would violate propor-ns not only in the given country itself but within entire socialist camp, and it would violate the balanced operation of industrial enterprises in the interconnected industries in other countries.

At the same time, in drawing up the plans it is necessary to take a more complete account of the resources which each country has at its disposal in order to properly use all the possibilities for accelerating the rates of economic development.

All the socialist countries are using yet another principle of planning on an ever wider scale — the constant check-up on the implementation of the plans in order to take timely measures to prevent a lagging behind in the fulfillment of the production plan, and thus to prevent the possibility of partial, temporary disproportions.

It is very important for each socialist country to strictly observe discipline in the implementation of all the targets set by the state plans. The national economic plan drawn up with the participation of the masses of workers, peasants, engineers, technicians and scientists, becomes a state law after it is approved by the leading bodies of the country, and the targets set by the state law cannot be arbitrarily changed by some economic bodies in the direction of lowering the production volume, violating the assortment and schedules of output, etc. All this plays an important part in the successful economic development of each country, and in ensuring the proportions established by mutual consent for the entire socialist camp in the production of certain types of products on the basis of coordinated national economic plans.

The coordination of national economic plans makes it possible to maintain a systematic and broad exchange of experience in socialist planning and to work out joint recommendations on the improvement of the methodology of planning. This ensures the improvement of planning in each country, the further development of scientific methodology in socialist planning and the achievement of a better grounding of the national economic development plans of the socialist countries directed towards successful building of socialism and communism in all countries of the socialist camp.

Coordination of the national economic plans of the socialist countries permits the maximum use of the advantages inherent in the socialist system in order to ensure a continuous and rapid economic advance. It is an important factor in the accelerated building of the material and technical base of socialism and communism in these countries.

Footnote

(1) V. I. Lenin, Collected Works, Vol. XXXV, p. 370 (Russian edition).

Vneshniaia Torgovlia, No. 12, 19

A. FRUMKIN:

The Bourgeois Theory of the "Foreign Trade Multiplier"

The so-called "foreign trade multiplier" theory, a theory widely current in contemporary bourgeois economic literature, is of interest from several points of view. First, it reflects the deep-rooted contradictions of capitalism in the sphere of foreign trade in the period of the general crisis of the capitalist system. Second, it stems from the Keynesian trend (referring to the well-known British economist, J. M. Keynes), the most influential trend in contemporary bourgeois political economy. Third, it is designed to theoretically substantiate and justify the foreign economic policy of the imperialist powers. It is used as a theoretical foundation for the foreign trade expansion of the monopolies.

Contemporary Bourgeois Political Economy and the Multiplier Theory

Contemporary bourgeois political economy clearly bears the stamp of the general crisis of capitalism. In the period of the general crisis, as we know, all contradictions inherent in capitalism have become extremely aggravated, with the contradiction between the productive forces and relations of production manifesting itself with particular force, leading to frequent deep and ruinous economic crises, to factories chronically working below capacity and to permanent mass unemployment.

In this situation, capitalist apologetics, which always has been and continues to be the vital calling of bourgeois political economy, is distinguished by several peculiarities. Bourgeois economists can no longer confine themselves to justifying capitalism and denying the obvious facts of exploitation, class contradictions, and so on. They now have a new purpose, one that is specific to this period, namely, to "save" capitalism, to reinforce the rocking edifice of the capitalist system. Today, besides playing the role of apologists for capitalism and "refuters" of Marxism, bourgeois economists also play the part of doctors concocting prescriptions for the "ailments" of capitalism and attempting to prove that the ailments can be cured. In the face of the sharpest class contradictions, the imperialist bourgeoisie is interested in creating in the mind of the masses the illusion that "the defects of capitalism can be corrected," in partic lar, that crises and unemployment can be prevented. Hence the demagogic criticism of only "certain defects" of the capitalist system, and th demagogic slogans of "a crisis-free capitalism" and "full employment."

Widely current in the imperialist countries in this period is Keynes' economic doctrine, a doctrine which is a full-blown defense of monopolisti capital in the specific conditions of the general crisis of capitalism. In his pseudo-scientific theory, Keynes proceeds from the premise that t spontaneous mechanism of the capitalist economy is by its nature sound, but it harbors certain defects which require intervention by the bourgeois state to be corrected.

It is on this basis that Keynes and his follower have advocated a system of state-monopolistic measures designed in words to eliminate crises and unemployment, but in deed to consolidate the rule of the financial oligarchy, to boost the profit of the monopolies. Keynes' main prescription is carry out such measures (inflation, state subsidi to the monopolies, increases in state expenditure and so on) the objective content of which is an attack on the living standards of the working peopl and the further enrichment of the monopolies wit the aid of the bourgeois state which they control. Expressing the interests of the monopolists who growing rich through the arms race, the Keynesians are primarily striving for a maximum incre in state expenditure for military purposes, callin this a panacea for crises and unemployment.

Prompted by the same desire to improve the e nomic situation in their country and to ensure hi er profits for the monopolies, bourgeois economists today are advocating further foreign trade expansion by the imperialist states and stepping their exports to the maximum. The "foreign tra multiplier" theory serves this very purpose.

What is the meaning of the "multiplier" in the Keynesian theory? In his main work, The Gener Theory of Employment, Interest, and Money, Keyn says that the volume of employment and the economic situation depend primarily on the amo of capital investments. Every investment (for i stance, the construction of a new factory) direct

rnishes employment for a certain number of orkers, giving rise to larger incomes and a high- demand for consumer goods. But that is not all. ie higher demand stimulates increased produc- on, employment and higher incomes in other branch- of the economy, and this, in turn, has a cor- sponding influence on new branches, and so on. a result of such a "chain reaction," the original vestment becomes the source of total increase in come and employment that considerably exceeds immediate effect in this respect. From this ems the conception of the "multiplier" which Keynes gards as a specific multiplier, a coefficient ich shows "by how much the given increase in vestment will augment demand as a whole." (1) attempting to determine the value of the multi- ier Keynes makes use of an imaginary psycholog- al factor — the so-called "marginal propensity to nsume." This allegedly determines how much of e increased income is spent on consumption and w much is saved. (2)

Without going into the far-fetched stratagems of urgeois political economy, we shall merely point t that if, for example, under Keynes' formula the ultiplier equals 2 1/2 (this figure "has been calcu- ted" by bourgeois economists for the United ates), this means that if as a result of new invest- ents industry takes on a certain number of work- s, say a million, work will be provided for an- ner million and a half, or there will be a total in- ease of two and a half million in the number of nployed.

What Do Bourgeois Economists Mean by the "Foreign Trade Multiplier"?

Bourgeois economists regard three factors as ssible sources of the original growth of income, other words, as the impetus on the basis of ich the effect of multiplication develops later. Ac- rding to them such original sources may be, first private investments, second — state expenditures e purpose of which is to make up for the insuffi- ency of private investments), and third — a fav- able balance of foreign trade. The first two ses are covered by Keynes' concept of the "in- stment multiplier," which should show the total se in income resulting from the given increase in vestment.

As for the third case, in which a favorable bal- ce of trade plays the role of the initial factor in country's rising income, it is treated specially in bourgeois theory of the so-called "foreign trade ltiplier." This theory, the principles of which re formulated in the above-mentioned work by ynes, has been developed in later years in books and articles by a number of contemporary bour- geois writers, mainly in the United States and Britain. Among these works are International Trade and the National Income Multiplier by F. Machlup (1943) and Prosperity and Depression (the latest enlarged edition of which came out in 1955) by Haberler, both American economists, The Fun- damentals of the Theory of World Economics (1956) by Forstmann, a West German author, and the article "The Foreign Trade and Balanced Bud- get Multipliers" by Holzman and Zellner in the American Economic Review for March, 1958.

The purpose of the "foreign trade multiplier" theory, according to its authors, is to ascertain the effect of foreign trade on a country's internal eco- nomic situation, primarily on its national income and volume of employment. "... the foreign trade multiplier," writes I. I. Polak, "is intended as a tool to gauge the effects on national income, em- ployment, etc., of a change in a country's foreign trade position." (3) Bourgeois economists assert that this effect is due to the fact that where foreign trade is carried on so as to produce a favorable trade balance (that is, if exports exceed imports) it makes for a flow of money from abroad and a rise in money income in the country. Machlup has stressed that "increased consumption disburse- ments, increased net investments, and improved trade balances will cause the flow of money income to rise."

Moreover, "a merely temporary increase in dis- bursements would have no permanent effect upon income. Only a lasting increase of primary dis- bursements (let us say, additional investments or additional exports, repeated in certain amounts pe- riod after period) can cause the income flow to rise to a higher level and to maintain it thereafter."

Bourgeois economists regard a growing favora- ble balance of trade as being of particular merit because in this case (in contrast to increased in- vestments within the country) the rise in money income is not accompanied by an increase in the mass of commodities. An excess of exports over imports "produces an income without a corre- sponding increase in the mass of commodities on hand." (4)

As a consequence, the favorable balance of trade becomes the source of primary income which, ac- cording to the general multiplier theory, gives rise to a secondary income, tertiary income, and so on. Because of this, the ultimate rise in na- tional income and employment and the improve- ment in the country's business situation is more marked than the favorable balance of trade which provided the original impetus for this process. "... an autonomous increase or decrease of

exports or decrease or increase of imports (as generator or destroyer of primary income)," says Machlup, "constitutes the multiplicand on which the foreign trade multiplier operates; the ultimate net change of incomes comes out as the product of that multiplication." (5) This is the essence of the contemporary bourgeois "foreign trade multiplier" theory.

In going into this theory in greater detail it is generally noted that changes in the volume of foreign trade and, in particular, in the volume of imports may be either "autonomous" (that is, not caused by changes in the amount of income in the country but due to other factors such as, for instance, lower customs tariffs or the use of new kinds of imported raw materials by industry), or "induced" (that is, directly caused by changes in the amount of money income, as, for instance, a reduction in imports of consumer goods due to a drop in the population's income). Insofar as a rise in the favorable trade balance makes for increased incomes in the country, according to this theory, this increase can be partly used to obtain imported goods, and in such a case the effect of the "foreign trade multiplier" on the country's business trend will be correspondingly smaller.

A lively controversy is going on in bourgeois political economy on the ways of formulating and defining the "foreign trade multiplier." The merits, advantages and shortcomings of particular formulas are being discussed (bourgeois economists are expounding their arguments in the language of algebraic formulas), and attempts are even being made to apply "theoretical principles" to analyze statistical data characterizing the economy and foreign trade of individual capitalist countries (such as Clark and Growford's book on the national income of Australia). However, no matter how much bourgeois writers may differ among themselves on some questions and details, they all uphold the Keynesian multiplier theory as a whole, as well as the basic principles relating to its application in the sphere of foreign trade — the idea of the "foreign trade multiplier."

Wherein Lies the Fallacy of This Theory?

The main apologetic conclusion drawn from the multiplier theory is that the economic policy of the bourgeios state, the aim of which is increased state expenditures, greater foreign trade expansion and the maintenance of a favorable balance of trade, can ensure a permanently high level of economic activity and a crisis-free development of the capitalist economy. Strictly speaking, the whole of the theory we are examining is designed to substantiate this conclusion.

Yet it is precisely this conclusion that is fundamentally fallacious and untenable from the standpoint of science. The conception of the "foreign trade multiplier" shows the extreme theoretical poverty of contemporary bourgeois political economy in its service to the interests of monopoly capital.

At the same time, this theory gives a clear ide of the methods contemporary bourgeois economic employs for its class, reactionary purposes. Beginning with some real (and incidentally, long-recognized) economic phenomena, bourgeois writers deck them out in a fancy, pseudo-scientific jacket and present them in a sensational and mys fying way, drawing conclusions that are quite arb trary but advantageous and convenient for the monopolists.

This is exactly the nature of the multiplier theo in general and the theory of the "foreign trade mu tiplier" in particular. It is well known that capita investments in any branch of the economy which give rise to a greater demand for means of production and labor power usually involve (because of the close interrelations among the different branches on the basis of the social division of labor) expanded production and, hence, increased capital investments in allied branches of the econ omy, and so on. This phenomenon of the so-calle "secondary effect" was noted by Karl Marx in his time. Incidentally, it should be remembered that Marx also showed the reverse side of this process, which bourgeois ideologists usually ignore: the spread of the economic crisis throughout the economy of a capitalist country as a result of the curtailment of production in some particular important industry. It is therefore perfectly natura that large state expenditure, in particular, gove ment armaments orders placed with the monopo can temporarily stimulate business activity and contribute to a general rise in industrial output. is precisely the militarization of the economy, th unchecked arms race in an atmosphere of war hysteria and the "cold war," that have been amon the factors making for increased output in the Un ed Stated in the postwar period.

Neither is there any need to deny the elementa truth that foreign trade expansion and the captur of foreign markets also stimulate expansion of p duction in an imperialist country and the enrichment of the monopolists. Comrade N. S. Khrushchev noted this role of foreign economic expansi in his report to the 20th Congress of the CPSU. For instance, expansion in foreign markets has u questionably been important for the economic de velopment of the United States and West Germany in recent years. It is indicative that the

orts of industrial goods from these countries e increased even more rapidly than industrial put at times.

However, the attempts of bourgeois economists substantiate the illusion that crises can be elimi-ed on the basis of these facts and that there is a ospect of permanent prosperity" under capital-n are entirely fallacious and absurd. References he role of foreign trade hold no water either. ing to the profound internal contradictions of italism (anarchy of production, the competitive uggle, the chase for profits, and so on), capital- accumulation inevitably exceeds the bounds of market, home as well as foreign, and this kes periodic crises of overproduction inevitable. oes without saying that no policy of a bourgeois te can "abolish" this objective law. Further-re, any measures which temporarily stimulate increase in capital investments and an expansion roduction, such as state expenditures or foreign de expansion, measures which can somewhat de- the coming of a crisis, in the final analysis in-tably lead to an even greater aggravation of the tradictions causing economic cirses.

n the "foreign trade multiplier" theory foreign de is pictured as an independent factor deter-ning to a considerable degree the fate of capi-st production. Actually, however, the movement he capitalist cycle is determined primarily by processes taking place in the sphere of produc-n and not circulation, by the contradictions of italist reproduction. Although foreign trade s have a certain effect on business trends in the italist economy, the state of international capi-st trade in the final analysis itself depends on phase of the cycle: in the expansion phase the ume of foreign trade grows and in the crisis se it declines. Moreover, in a period of eco-nic crisis the volume of foreign trade often drops n more than the volume of industrial output. At same time, foreign trade helps to spread the sis from its "point of origin," which of late has st often been the United States of America, to er capitalist countries.

he volume of world trade depends a great deal he requirements and capacity of the home mar-s of the individual countries, and this capacity ntirely determined by the movement of produc-, the dynamics of capitalist investments, em-yment, and so on. The market, including the eign market, is by no means something apart, ring no relation to capitalist production. Con-ry to the views of bourgeois writers, Marxist-inist political economy has shown that no inde-dent problem of markets exists (that is, pendent of the process of reproduction), and that the rise and development of the market is but an integral, component part of the process of capitalist reproduction, part and parcel of this process. This thesis was substantiated in great detail by Lenin in his works on the theory of reproduction of social capital.

The "foreign trade multiplier" theory pictures the structure of the national income of capitalist countries and the influence of foreign trade on the national income altogether incorrectly. The basic "foreign trade multiplier" formula — national income equals the sum of consumption, investments and exports minus imports — distorts the real essence of the national income of a bourgeois state, concealing its class-antagonistic nature.

Marxist-Leninist political economy shows that national income under capitalism, representing as it does the new value created by the working people in the course of a given year, is divided into two parts: the part which reimburses the expended variable capital, that is, wages, and the part which embodies surplus value. The two parts correspond to the incomes of the two main classes of bourgeois society, namely, wage workers and capitalists. The national income of a capitalist country is therefore the aggregate amount of the variable capital and surplus value.

What bourgeois economists designate by the single term "consumption" is in reality the consumption expenditures of two opposite classes from two different sources of income (wages and part of surplus value). As regards investments, the money of course comes out of surplus value primarily (and partly out of the depreciation reserves of fixed capital). All these existing class relations are completely absent from the bourgeois formula for national income. Moreover, this formula is faulty not only qualitatively but also quantitatively. In the first place the sum of "consumption" and "investment" does not make up the national income, since under capitalism (especially contemporary capitalism), owing to the low purchasing power of the population there inevitably accumulate considerable stocks of unsold commodities (articles of consumption as well as means of production) far beyond the limits of reserves needed for the normal course of the process of reproduction. Thus, not all of the national income is annually absorbed in the form of "consumption" and "investment," as bourgeois political economy asserts. In the second place a part of the capital investments, those which are merely used to compensate for the means of production used up earlier, come from depreciation funds and therefore have no relation whatever to the realization of the national income.

The bourgeois notions concerning the role

played by foreign trade in the national income are equally unfounded. As we have seen, according to these notions exports increase the national income and imports reduce it. Is this really so? Of course not.

As we know, the national income is created exclusively in the sphere of material production as a result of the expenditure of productive labor. In the sphere of circulation, however, that is, in trade (domestic and foreign) there occurs merely the realization of goods already produced, in other words, the conversion of value from the commodity form to the money form, or, what is virtually the same thing, the exchange of one commodity for another. The total amount of commodity values resulting from production and entering the market (domestic and foreign), of course, has not changed at all. Foreign trade, examined from this standpoint of the Marxist theory of reproduction, is nothing more than the exchange of a part of the national product of one country for a part of the national product of other countries, the exchange of home commodities for foreign commodities differing in their natural form but equivalent in value (if we temporarily disregard the non-equivalent foreign trade exchange widely practiced by the imperialist countries and for this reason passed over in silence by the ideologists of imperialism). The national income of each country (bearing in mind the stated reservation) undergoes no changes. In analyzing the reproduction of social capital, Marxist-Leninist political economy for these reasons quite justifiably abstracts from foreign trade.

At the same time it should be stated that under capitalism foreign trade can really be a source of growth of the national income of some countries, but in quite a different way from the manner in which bourgeois theory pictures it. First, through non-equivalent foreign trade exchange the imperialist countries appropriate for themselves (to be more exact, for the benefit of the monopolies) a part of the national income of the colonial and dependent countries. Second, these states regularly derive a considerable amount of income in commodity form from their foreign investments abroad. Both of these phenomena, contrary to the "foreign trade multiplier" theory, have to do not merely with exports but certainly with imports too, in essence, with free imports, as Marx called them. This tribute is the result of the exploitation of other countries, primarily underdeveloped countries of the capitalist world, by the imperialists.

The favorable or unfavorable effect of foreign trade on the amount of the national income is not connected with a favorable or unfavorable balance of trade, but stems from the fact that international trade can promote (or, on the contrary, hinder), the all-round development of a country's productive forces and thereby lead to a rise in (or check the rise of) the national income. To illustrate, th great positive role played by trade among the socialist countries consists precisely in that. Thus the supplying of machines and other equipment by the Soviet Union to China has contributed to a large degree to the rapid development of the latter's industry and national income. This also hol true for trade between the Soviet Union and the u derdeveloped capitalist countries.

On the other hand, because the imperialist states try to export mainly consumer goods to bac ward countries (not infrequently competing with l cal goods), and not modern equipment needed for industrializing these countries, such trade, regardless of prices and the proportions of the foreign trade exchange, is essentially unequal and u profitable for the underdeveloped countries.

Permeating the "foreign trade multiplier" theo is the peculiar money fetishism that is so charac teristic of contemporary bourgeois political econ omy and which is expressed in all its fullness in Keynes' views. It is alleged that the amount of money is one of the main factors determining the volume of output and employment and the state of business activity in the capitalist economy.

This Keynesian idea runs all through the "foreign trade multiplier" theory. Exports ensure a flow of money from abroad, bourgeois economist argue, the amount of money in the country grows and therefore the income and purchasing power o the population, business activity and employment also rise. The beneficial effect of exports on bus iness conditions is even greater as a result of th multiplier effect. Imports, on the contrary, are connected with the outflow of money from the cou try and therefore allegedly make for decreasing come and purchasing power, thus adversely affec ing business trends. It is not surprising that Ma lup begins his book on the foreign trade multiplie with a chapter on "The Circular Flow of Money" society, later passing on to an examination of the effect of foreign trade on the circular flow and o the quantity of money in the country. "If the picture of the circular flow is confined to the nation economy," Machlup writes, "receipts from expor and disbursements for imports must be consider as injections into the flow and ejections from it, respectively."

All this reasoning is a typical illustration of th currency cretinism to which most contemporary bourgeois economists are subject and which is used by them for apologetic purposes.

What do "receipts from exports" really repres

l where do they go? As we know, in internation-
rade goods are usually sold to be paid for in for-
n currency (or foreign bills of exchange), and in
e cases in gold. The currency (or gold) re-
ved is a reserve for international settlements,
er used to pay for imports. The amount and
vement of this reserve is wholly determined by
country's balance of payments and has no direct
ect on the circular flow of money in the country,
the amount of money in circulation. To this it
uld be added that the amount of money in circu-
on and the amount of purchasing power, con-
ry to the customary notions of Keynesian econo-
sts, are far from identical categories; they are
ermined by different factors and may change in
ferent directions. Thus, when there is inflation,
ch has long since become an almost constant
comitant of capitalism, the mass of paper money
ws and the purchasing power of the working peo-
declines.

The effort to divorce exports from imports and
ard them as independent of each other, which is
racteristic of the "foreign trade multiplier"
ory, is untenable scientifically and is refuted by
daily practice of international trade. This prac-
e proves that the essence of this trade is not uni-
eral export or import transactions, but mutual
hange of commodities, which, of course, does
preclude the possibility of a favorable or un-
orable balance of trade.

The pivotal point of the "foreign trade multiplier"
ory is that a favorable balance of trade has de-
able effects. According to the multiplier idea it
ot foreign trade in itself but a favorable for-
n trade balance that is one of the main factors
nulating a rise in production and employment,
ansion of business activity, and so on. Proceed-
from this premise, bourgeois theoreticians as-
t that a rise in the unfavorable balance of trade
ds to diametrically opposite results, in other
ds, to a highly unfavorable effect on the coun-
's economic condition, causing a drop in the na-
al income, employment, and so on. The West
man economic Paulsen said on this score: "Un-
anced trade leads to a rise or fall in income,
ch gives rise to the operation of the multiplier.
drop in income due to an excess of imports al-
makes for lower incomes within the country, as
extra savings (because of the decrease in in-
tments); the increase in income due to a sur-
s of exports boosts total income to an even
ater degree than the amount of the increase."
In another contemporary work, too, we read
"imports, ... like savings, have a depressing
ct." (7)

rom this conception there naturally follows the conclusion that a balanced foreign trade, one in which exports and imports cover one another and change in the same direction, does not in any way — either favorably or unfavorably — influence a country's level of economic activity. "Only an excess of exports" (over imports — A. F.), Haberler writes, "can be regarded as a stimulating factor, while a parallel rise in imports and exports should be regarded as a netural phenomenon." (8)

This interpretation of the balance of trade and its alleged effect on a country's economic situation springs from Keynes' works, as does the entire "foreign trade multiplier" theory. "It is very important," Keynes says, "that the government give close attention to the balance of trade. The point is that a favorable balance of trade, provided it is not too great, is highly stimulating to the economy, while an unfavorable balance may create a persistent depression." (9)

Strange as it may seem at first glance, this latest bourgeois "foreign trade multiplier" theory, which emerged in the period of the general crisis of capitalism, has some features resembling the theory of the mercantilists, who (under developed mercantilism) identified wealth with money (gold) and regarded the flow of money from abroad on the basis of a favorable balance of trade as the only source of profit. That is why the mercantilists' insistent demand was: more exports of commodities and less imports. It is not surprising, therefore, that the bourgeois economists of today are trying to use the mercantilists as their allies. Thus, Keynes devoted many pages to praising the wisdom of the mercantilists, criticizing bourgeois classical political economy for scorning what was valuable in the works of its predecessors, and appealing to contemporary writers to make a thorough study of mercantilist theory.

Marx wrote that historical events often occur twice: once as tragedy and the other time as farce. Something like this is taking place today in bourgeois economics. Despite the naivete of their notions, the mercantilists in their day, Marx said, made the first attempt to analyze the capitalist mode of production theoretically. They worked in the epoch of the formation and rapid development of capitalism. Bourgeois economists of today are working in the epoch of moribund capitalism, in the period in which the general crisis of capitalism is growing ever deeper and all its contradictions are steadily growing sharper. What spurs bourgeois writers' pseudo-scientific searches now is their vain attempt to find some way out of these contradictions, an attempt which is doomed to failure. In these conditions their alliance with the mercantilists and their appeals to learn state wisdom

from the ideologists of the 17th century and with their aid to solve the problems of today, in particular the problem of international trade, indeed looks like a farce.

Apology for Foreign Trade Expansion by the Monopolies

It is not difficult to see that the "foreign trade multiplier" theory bears the distinct stamp of the profound contradictions of modern capitalism. The hopeless striving to escape from these contradictions has driven bourgeois writers to resort to absurd inventions that are in conflict with the elementary laws of economic life.

First of all we must not fail to call attention to the fact that in recent decades bourgeois political leaders and economists have had to increasingly consider problems of foreign trade mainly because the problem of the sale of goods in the home markets of the capitalist countries has become an extremely difficult one. Thus, the late Cordell Hull, eminent American diplomat, repeatedly and insistently stressed that foreign policy for the United States of America should be chiefly a means of getting rid of "surplus goods." The essence of foreign policy, he said, "was to export the ever increasing amount of surplus products." (10)

This refrain is even louder in the bulk of the postwar works of bourgeois economists in the United States, Britain, West Germany, France and other countries. Export expansion should create an outlet for the surplus commodities which cannot be sold inside the country due to the limited purchasing power of the population, anarchy and lack of balance of capitalist production (this, of course, is passed over in silence), and thereby ensure "economic stability." This is the thought echoed in every possible way by these writers.

It is indicative, in particular, that in a number of books by bourgeois writers which have appeared in recent years, books permeated by fear for the fate of American capitalism and appealing for its "rescue," the expansion of exports is usually recommended along with other prescriptions. Thus, Seymour Harris, in a volume of articles under the title Saving American Capitalism, regards it as necessary to recall that the slump in American exports in the 1930's was an important factor in the "worsening of economic conditions," (11) in other words, in the deepening of the economic crisis. In a book bearing the characteristic title Making Capitalism Work, D. M. Keezer also emphasizes that "exports are extremely important for good business conditions in the United States," and demands "the extension of world trade, in which the United States could play the part of the leading creditor to the extent necessary for keeping industry working at full capacity." (12) Only a substantial expansion of exports "can make the wheels of our machines turn and provide work for our population," writes Javits. (13)

It is highly indicative that in all these statemen the number of which could easily be multiplied, fo eign trade is not regarded in the light of an international division of labor and mutual exchange of goods but only from the standpoint of overcoming the contradictions of the home market and solely as an additional channel for the sale of "surplus" goods. This explains the special attention given t exports and the deliberate ignoring of imports.

This is the soil which produced the doctrine of the "foreign trade multiplier," a doctrine which gives theoretical expression to an justification fo these views. This theory "scientifically" substan tiates the thesis that exports are good for a country and should be welcomed and encouraged in every way, while imports are an unavoidable evil and should be kept down to the utmost. The theor is essentially absurd but quite natural for modern capitalism, which is gasping in the vise of insoluble contradictions. What ensures the best busine conditions, what is most desirable in the light of the "foreign trade multiplier" theory, is a policy of exports without imports or, in any case, increasing exports while cutting or at least stabilizing i ports. Could a better "theoretical" formula be found for justifying and propagating foreign trade expansion by the imperialist states?

The trouble is that this theory and the inferences drawn from it, while so convenient and suit ble for the monopolists, do not conform to objective economic laws, and the virtual attempt to ignore these laws inevitably leads to very severe consequences. Trade is by its nature a two-way process. We cannot keep on selling for a long tim without buying. No country can, as a rule, keep increasing exports without at the same time increasing imports. If this does happen, before lon it will inevitably be found that the other countrie have no money to pay for goods and are forced to curtail their purchases.

Ridiculing the assertion of some bourgeois writers that there was no production in the ancie world and whole nations lived by plundering othe peoples, Marx pointed out that under such conditions, too, the things plundered obviously had to b regularly reproduced. And for some countries to have the possibility of constantly increasing thei exports while imports remain unchanged (as the "foreign trade multiplier" theory presupposes), there apparently would also have to be imaginary

untries which could appear in the world market lely or chiefly as importers. The question arises: the given conditions where would these countries d a permanent source of funds to pay for such ports?

As we know, the foreign trade of the United ates since the war has developed in conformity th the basic principles of the multiplier theory. epping up its exports to the utmost, the United ates at the same time has limited its imports th the aid of various protectionist measures, thus suring an immense favorable balance of trade an- ally. And what has been the result of this prac- e? At first the extraction of the gold reserves the other capitalist countries (primarily the est European), and later the appearance of the -called dollar shortage in the countries buying nerican goods, a shortage that led to the ruinous slocation of international economic relations in e capitalist world, something that has become a rious obstacle to the further one-sided expansion American exports. The "foreign trade multi- er" theory expresses rather well the characteris- desire of imperialist countries to solve their ntradictions and grow rich at the expense of oth- countries.

At the same time this theory leads to such ab- rd conclusions (such as the conclusion that a se in imports means a decline in the national in- me) that even some bourgeois writers have par- lly realized this and are trying to introduce cer- n amendments and reservations. A. Forstmann, instance, has admitted that the champions of the reign trade multiplier" theory have encountered gical difficulties" (14) relating primarily to the estion of the role played by imports. Then fol- ved the argument that if for some countries (the veloped countries for whom this theory is pri- rily intended) it is of advantage to have a stable orable balance of trade, "consequently" for me other countries it is advantageous to have as ble an unfavorable balance of trade. In Forst- nn's view, such countries are the debtor coun- es which import goods against loans and credits y receive abroad. This reservation should be rne in mind when speaking of the effect of im- ts on the national income.

Other bourgeois economists assert that the rise imports has a depressing effect on the country's nomic situation only where these are "induced ports," that is, if they are due to the population's reased money income. However, where imports e as a result of "autonomous causes," that is, a result of some structural changes in the econ- y (such as those stemming from the use of new ds of imported raw materials in industry), they do not have such an unfavorable effect.

Sometimes the following reservation is made. A distinction should be made between the sources from which the growing imports are paid: whether from income earmarked in advance for buying goods produced in the country, or from savings which in any case would have remained out of circulation (it is assumed that in the latter case the national income will not decline).

It is obvious that none of these "corrections" can improve a theory that is basically faulty and cannot rid it of insoluble contradictions. What is noteworthy is Forstmann's forced admission that the much desired favorable balance of trade can best be ensured by exploiting the backward countries that are entangled in the net of financial dependence on the imperialist states.

Bourgeois Foreign Trade Theory and Imperialist Practice

The reactionary character of the bourgeois "foreign trade multiplier" theory stands out particularly clearly if we examine the practical conclusions and recommendations in the sphere of foreign trade policy which follow directly from this theory.

Many bourgeois economists have noted the link between this theory and certain "principles" of trade policy. Machlup, for instance, has stated that the "multiplier theory has become fashionable ... as a technique of persuasion in the advocacy of economic policies." (15)

If exports are an extraordinary boon and imports an extreme evil, as the "foreign trade multiplier" theory essentially asserts, it naturally follows that the state in its foreign policy should, on the one hand, encourage and stimulate exports in every way, and on the other, limit imports just as energetically. The "foreign trade multiplier" thus serves to substantiate and justify export subsidies by the state, dumping, aggressive monopolistic protectionism — all the typical methods of foreign trade policy of the imperialist states. This theory reflects the desperate struggle waged by the monopolies for commodity markets in our epoch. "An autonomous improvement of the foreign trade balance will generate income, not only temporarily but permanently ... Exports gained through subsidies, and imports cut down through tariffs, quotas or exchange restrictions, are recommended as efficient generators of national income." (15) This is the way Machlup describes the widely current practical interpretation of the "foreign trade multiplier" theory. As can be seen, this is indeed a theory of trade war, which is so

characteristic of the capitalist world market.

Directly reflected in the program which Machlup, Hansen, Harris and other American economists have advocated, with particular stress laid on the "foreign trade multiplier" theory, are the ways and means now used by the American monopolists for their economic expansion.

At the end of his book Machlup gives the following conclusion: "I believe, however, that it is the case of capital export from countries with abundant capital supply to countries with meager capital supply which is probably the most significant 'lesson' from our analysis. ... As a result, both nations will have their incomes increased, the borrowing country in consequence of the increased investment activity, the lending country in consequence of the increased export business. The exports and their income-generating effects may even overcompensate some slight reductions in home investment in the lending country, if such could not be avoided in the course of the capital outfolws." Machlup states further that "the use of multiplier theory as an argument for generous foreign lending — the 'imperialist' interpretation of the theory of the multiplier — probably will be vehemently opposed by advocates of economic and political isolationism."

The further line of his arguments, paradoxical as it may seem at first glance, serves as a graphic illustration of the Leninist theory of the export of capital. Machlup considers the following objection to foreign economic expansion: Why should we build up the productive equipment of backward nations when there are plenty of things to do at home (slum clearances, road improvements, etc.)? And the answer he gives to this objection is truly a "classic." "These questions," he writes, "cannot be answered on the grounds of economic theory." Yes, indeed, neither these nor other questions like them can be answered from the standpoint of bourgeois political economy, and some of its representatives (like Machlup) unwittingly testify to the bankruptcy of their pseudo-science. All these facts, however, have received an exhaustive and truly scientific explanation in the light of Lenin's theory of imperialism. We cannot help recalling here Lenin's words which profoundly reveal the true reasons and motives for the export of capital from imperialist states: "... If capitalism could develop agriculture, which today lags frightfully behind industry everywhere, if it could raise the standard of living of the masses, who are everywhere still half-starved and poverty-stricken in spite of amazing technical progress, there could be no talk of a superabundance of capital. This 'argument' is very often advanced by petty-bourgeois critics of capitalism. But if capitalism did these things it would not be capitalism; for bo uneven development and a semi-starvation level existence of the masses are fundamental and inevitable conditions and premises of this mode of production. As long as capitalism remains what is, surplus capital will be utilized not for the pur pose of raising the standard of living of the mass in a given country, for this would mean a decline profits for the capitalists, but for the purpose of increasing profits by exporting capital abroad to the backward countries ... The necessity for exporting capital arises from the fact that in a few countries capitalism has become 'over-ripe' and (owing to the backward stage of agriculture and t impoverished state of the masses) capital cannot find a field for 'profitable' investment." (16)

This is the crux of the matter! And bourgeois ideologists of the export of capital are trying to conceal it.

And so, the practical program of American ec omists, a program directly related to the "foreig trade multiplier" theory, is reduced to the follow ing. The United States is exporting capital on a large and ever increasing scale, thereby ensurin itself a favorable balance of trade, which, based the "foreign trade multiplier," helps to sustain a high level of output and employment, in other wor a high level of business activity in the country. sides Machlup, this idea was developed by Hanse one of the leading contemporary bourgeois econo mists in the United States, in his book entitled America's Role in the World Economy written at the end of the war (1945). This book received wi comment in imperialist circles. These authors were the first to substantiate "theoretically" the program of United States postwar foreign econon expansion. And that is exactly why Forstmann, instance, has asserted that the "foreign trade mu tiplier" theory "has influenced the foreign economic measures taken by the United States." (1 Obviously, this has to be understood in its proper sense and not as the bourgeois ideologists do. T roots of any policy should be sought, of course, actual economic conditions, in the operation of t objective economic laws of modern capitalism. the same time, however, bourgeois economic theories, which also originate on the basis of ce tain objective conditions and reflect the practica interests of monopolistic capital, may give a ce tain impetus to a corresponding policy and prom it. It is indisputable, for instance, that a numbe of economic measures taken by the Roosevelt Ad ministration were carried out under the influenc of the Keynesian conception, and the purpose of "foreign trade multiplier" theory was to substan tiate "scientifically" the postwar foreign econom

icy of the United States. The theory and practice he export of capital have undergone certain nges in this connection.

The point is that the usual export of capital, while ectly stimulating the export of goods, at the ne time inevitably leads after a certain period to ise in imports, since capital investments abroad e used to a considerable extent for the production raw materials to supply industry in the imperi- st countries, and also because interest and divi- ds on capital invested abroad (except the part ich is reinvested locally) are often spent to pay imported goods, in other words, they are ap- priated in commodity form. From the stand- nt of the "foreign trade multiplier" theory the ort of capital therefore has not only a positive nificance (promoting the export of goods), but o negative implications (a rise in imports). reover, we know that the export of capital over a g period sometimes leads to a situation in which income from capital invested earlier equals or en exceeds new investments abroad. Besides, export of capital in the usual form of loans, edits, and so on, not infrequently comes up against obstacle like the lack of funds by the borrower pay commitments abroad.

For all these reasons bourgeois economists in United States, in conformity with the "foreign de multiplier" theory, during the war and post- r period tried to substantiate a new form of the ort of capital, namely, the so-called gratuitous ssistance" to other capitalist countries through nting government funds. This was advocated by nsen, Harris and many other ideologists of erican imperialism, representatives of the ger monopolies and ruling circles of the United tes. This new form of economic enslavement of er countries appeared to have surmounted the itations and contradictions of the usual export of ital and promised brilliant prospects — accord- to the multiplier theory — for maintaining a ularly high level of business activity in the coun- . "Assistance" to foreign states which does not uire the paying of interest or repaying the sum eived seems to have embodied the cherished am of bourgeois economists and politicians: maximum stepping up of exports with no rise in orts.

However, all these calculations and hopes proved ave been built on sand in practice, as was to be ected. Their collapse was at the same time quent proof of the complete bankruptcy of the reign trade multiplier" theory.

ndeed, if we take a look at the loans and sub- ies given by the United States government to eign countries it is not difficult to see that the billions of dollars which the American government gave and is giving as "aid" to other countries come from the pockets of the taxpayers — the working people of the United States — thereby further cutting their purchasing power in the home market. Hence, the possibility of selling goods which is created for the American monopolies by government subsidies and loans to foreign countries arises not in addition to effective demand inside the country, as is asserted by the "foreign trade multiplier" theory, but to a considerable extent at the expense of this demand. The gain in the foreign market appears inevitably to be accompanied by a loss in the home market. And only bourgeois multiplier alchemy can see in such an operation a "deliverance from crises."

Since the war, the United States has given other capitalist countries "assistance" from government funds to the tune of 81.8 billion dollars (as of June 1958). This has enabled it to expand its exports on a substantial scale and (coupled with the restriction of imports) to ensure an enormous favorable balance of trade (the US favorable balance of payments on current operations between 1945 and 1957 came to 79.6 billion dollars). Foreign trade expansion, of course, temporarily boosted industrial output in the United States, and it would seem that the conditions needed for the operation of the "foreign trade multiplier" were present. But what happened? Has this policy (coupled with such a factor as the stepped-up arms race) prevented greater unemployment in the United States and critical slumps in production? By no means. In the past 12 years the United States has experienced three critical slumps in production (in 1948-1949, 1953-1954, and especially in 1957-1958).

Characterizing the economic situation in the United States and other capitalist countries, Comrade N. S. Khrushchev said in his report to the 21st Congress of the CPSU: "The continuous alternation of critical slumps and feverish uptrends indicates the instability of the capitalist economy. Neither the arms race nor any other measure will ever rid the economy of the United States and the other capitalist countries of overproduction crises. Whatever the capitalist states may do, they will never eliminate the cause of crises. Capitalism will never break the death grip of its own contradictions. They keep growing in size and scope, holding the threat of new economic upheavals."

Capitalist reality has again and again shown that crises were, are and will continue to be the inevitable concomitants of capitalism.

The Soviet Union, like the other socialist countries, has no desire to play the part of only a seller or only a buyer. It stands for the mutually

profitable international exchange of commodities on an equal footing. A useful role in the development of such trade can be played by commercial credits on fair terms.

Trade relations between capitalist countries and the socialist world market, which is not beset by critical slumps and has a stable and steadily growing capacity, undoubtedly can have a favorable effect on the economy, or at any rate, some branches of the economy, of some capitalist countries.

During his historic trip to the United States Comrade N. S. Khrushchev called on the ruling circles of the United States to give up their arms race and cold war policy as well as the attendant practice of discrimination in international trade. It is not the arms race and discrimination in foreign trade, nor the unilateral stepping up of exports, nor trade wars, nor exploitation of some countries by others through foreign trade, but complete and universal disarmament, peaceful competition of the two systems and mutually profitable economic cooperation, that the socialist countries have put forward against the bourgeois theory and practice of international trade.

***

Footnotes

(1) J. M. Keynes, The General Theory of Employment, Interest, and Money, 1948, p. 291. [quotation retranslated from the Russian — editor.]

(2) More detailed treatment of the general multiplier theory will be found in Voprosy Ekonomiki, No. 2, 1959, in P. Oldak's article "Bourgeois Theories of Economic Cycles."

(3) I. I. Polak, "The Foreign Trade Multipli American Economic Review, December, 1947, p 891.

(4) C. Clark and I. G. Growford, The Nation Income of Australia, London, 1939, p. 93. [retra lated from the Russian — editor.]

(5) F. Machlup, International Trade and the tional Income Multiplier, pp. 11-12.

(6) A. Paulsen, Neue Wirtschaftslehre, Fra furt a.M. und Berlin, 1954, p. 204.

(7) E. Preiser. "Kapitalexport und Vollbe- schaftigung," Jahrbucher für Nationalekonomie Statistik, Vol. 162, 1950, p. 329.

(8) G. Haberler, Prosperitat und Depressio Tübingen, 1955, p. 446.

(9) J. M. Keynes, op. cit., pp. 327-328. [quo tion retranslated from the Russian — editor.]

(10) Quoted from the American Economic Re view, March 1953, p. 104. [retranslated from t Russian — editor.]

(11) Seymour Harris, editor, Saving America Capitalism, N.Y., 1948, p. 274. [retranslated fr the Russian.]

(12) D. M. Keezer and others, Making Capita ism Work, N.Y., 1950, p. 186. [retranslated fr the Russian — editor.]

(13) J. Javits, Peace by Investment, N.Y., 19 [retranslated from the Russian — editor.]

(14) A. Forstmann, Die Grundlagen der Auss wirtschaftstheorie, Berlin, 1956, p. 170.

(15) F. Machlup, op. cit.

(16) V. I. Lenin, Collected Works, Vol. XXII, 228-229 — Russian edition.

(17) A. Forstmann, op. cit., p. 332.

***

FILED IN STACKS

ANNOUNCING:

PROBLEMS OF ECONOMICS REPRINTS FOR CLASSROOM US

Translations of Selected Articles from Soviet Economics Journals

Fundamentals of Labor Law of the USSR and the Constituent Republics: A Draft *(Sotsialisticheskii Trud,* 1959, No. 10, pp. 4-16). $1.50

S. PARTIGUL: Demand and Supply Under Socialism *(Voprosy Ekonomiki,* 1959, No. 10, pp. 80-89). $1.00

T. KHACHATUROV: Economic Effectiveness of Integrated Mechanization and Automation *(Voprosy Ekonomiki,* 1959, No. 12, pp. 61-74). $1.50

R. NAZAROV: The Increasing Level and Changing Structure of Food Consumption in the USSR *(Voprosy Ekonomiki,* 1959, No. 11, pp. 110-119). $1.50

E. ANTOSENKOV and V. MOSKALENKO: The Soviet Union's Program of Reducing the Working Day and the Working Week *(Planovoe Khoziaistvo,* 1959, No. 11, pp. 30-38). $1.25

L. KANTOROVICH: On the Calculation of Production Inputs *(Voprosy Ekonomiki,* 1960, No. 1, pp. 122-134). $1.50

F. BYSTROV: The Organization of International Settlements Among Socialist Countries *(Voprosy Ekonomiki,* 1960, No. 2, pp. 112-119). $1.25

V. STAROVSKII: On the Methodology of Comparing Economic Indices of the USSR and the USA *(Voprosy Ekonomiki,* 1960, No. 4, pp. 103-117). $1.50

IA. IOFFE: The Level of Labor Productivity in the USSR and the USA *(Planovoe Khoziaistvo,* 1960, No. 3, pp. 45-55). $1.50

The Economic Research Institute of the USSR State Planning Committee: American Economists on the Competition Between the USSR and the USA *(Planovoe Khoziaistvo,* 1960, No. 1, pp. 11-26). $1.00

B. SUKHAREVSKII: The Working Day and Wages in the USSR *(Kommunist,* 1960, No. 3, pp. 22-37). $1.50

E. VARGA: Twentieth Century Capitalism (*Mirovaia Ekonomika i Mezhdunarodnye Otnosheniia,* 1960, No. 1, pp. 34-59). $1.00

A. KATS: On the Question of the So-Called "Income Revolution" in the USA *(Mirovaia Ekonomika i Mezhdunarodnye Otnosheniia,* 1959, No. 8, pp. 84-103). $1.00

G. RUBINSHTEIN: The Development of Soviet Imports *(Vneshniaia Torgovlia,* 1960, No. 5). $1.00

30% discount on bulk orders of 10 or more copies of any article

ALL ORDERS MUST BE PREPAID

INTERNATIONAL ARTS AND SCIENCES PRESS
156 Fifth Avenue, New York 10, N. Y.